PUERTO RICO AGRICULTURAL EXPERIMENT STATION
MAYAGUEZ, PUERTO RICO
Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 35

SUGARCANE VARIETY P.O.J. 2878 IN PUERTO RICO

By

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Agronomist

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CONTENTS

INTRODUCTION

Sugarcane variety P.O.J. 2878 (fig. 1) was introduced into Puerto Rico from Java in March 1927. In view of its outstanding behavior in Java, every effort was made to propagate it rapidly. The experiment station at Mayaguez instructed planters how to propagate it by both the Javan method, which consists of separating young shoots from the original stool, and by the single-eye method. The variety is very prolific and grows rapidly—characters which facilitate propagation. Within 2 years after its introduction, the area on which the variety was grown had been extended to several thousand acres—a hasty extension which proved disastrous in some cases.

Soon after distribution of the variety in March 1928, the experiment station cautioned cane growers against extending its culture on too large a scale until more was known of its sugar-producing qualities as compared with varieties already in cultivation. Seed was distributed with the express understanding that it was to be used for experimental purposes only. Disregard of this caution resulted in large-scale failures in some cane-growing districts.

In view of the contrasting climatic conditions in various parts of the island, the behavior of P.O.J. 2878 will be discussed by localities, considering in particular the east coast, the north coast, Central Coloso, Central Pagan, the San German Valley, and the south coast, respectively. Special consideration was given to soil types in which P.O.J. 2878 was grown, uprooting as a storm risk, reduced cultivation and replanting costs in ratoon crops, the advantages and

32912°—34——1

disadvantages of P.O.J. 2878 during harvesting operations, and retarded defecation.

The data on general field plantings are submitted mainly to indicate the general adaptability of P.O.J. 2878. Under the data of each field of P.O.J. 2878 the data of adjoining fields of other varieties are given. Such figures, although barely indicative of the relative productions of varieties, are, nevertheless, helpful in explaining the wide variations in percentage of sugar in cane between the north-coast lowlands where P.O.J. 2878 was a failure, and the San German Valley where it was the outstanding variety.[1]

The variety trials at Cambalache, San Vicente, Central Aguirre, and Filial Amor were made by the Insular Department of Agriculture.

FIGURE 1.—Typical portion of half-acre plats of gran-cultura sugarcane varieties P.O.J. 2878 on the left, and P.O.J. 2725 on the right, 5 months old. P.O.J. 2878 compares well with P.O.J. 2725 in stooling habit and makes the more rapid growth throughout the crop period. P.O.J. 2878 averaged more than a foot taller than P.O.J. 2725. Photographed December 5, 1930, at Hormigueros, in the San German Valley district.

The data on the first three variety trials are based on information published by the Insular Experiment Station.[2]

EXPERIMENTAL METHODS

All sugar yields were calculated by means of the Winter-Carp-Geerligs formula, modified at each central according to milling and

[1] Acknowledgment is made to the Bureau of Chemistry and Soils, U.S. Department of Agriculture, and the Insular Experiment Station for permission to use soil-survey maps prior to their publication in identifying soil types. Unless otherwise indicated, James Thorp and Ray C. Roberts of the Bureau of Chemistry and Soils identified the soil types of all fields herein reported. The names and descriptions of the soil series are not given as they have not yet been confirmed.

[2] The Mayaguez station acknowledges with appreciation the active cooperation of the Insular Experiment Station which supplied the data of the Filial Amor experiment prior to their publication, and of Guillermo Cabrera, of Central Coloso; Rafael Bermudez, of Central Fajardo; E. H. Barrow, Owen Proverbs, and Waldemar Riff, of Russell & Co.; A. J. Sykes, of Rio Piedras, Emilio Rola, of Central Cambalache, Ubaldino Ramirez, of Central Igualdad, Manuel del Valle, of Central Constancia; Aristides Gonzales, of Central Carmen; Marcelo J. Oben, of Central Aguirre; Jaime Annexy and Francisco Suria, of Central Eureka; Antonio Roig, of Humacao; G. M. Giles and G. Cortada, Jr., of Central Mercedita, Ponce; and P. Menendez, of Central Plazuela.

factory efficiency, and Spencer's [3] table for available sugars was used. At Central Fajardo the following formula was used:

$$\text{Yield} = [\text{normal sucrose} - (\text{normal Brix} \times 0.32)] \times 1.14.$$

The Aguirre formula was as follows:

$$\text{Yield} = [\text{normal sucrose} - (\text{normal Brix} - \text{normal sucrose}) \times 0.4] \times 0.8.$$

The generalized probable errors for the Coloso experiment were calculated through use of the following formula, discussed by Richey:[4]

$$\frac{\sigma^2 e}{n} = \frac{m\,(\sigma^2 T - \sigma^2 R - \sigma^2 G)}{(m-1)(n-1)}.$$

The significance of the data in the other experiments was determined by Love's method.[5]

SEASONAL CONDITIONS

Results from P.O.J. 2878 in 1931–32 were in decided contrast where soil and climatic conditions differed, the percentages of sugar in cane being very poor along the north coast and very good in the San German Valley. This may be explained partly by differences in the rainfall distribution, particularly during the critical ripening period of December, January, and February, as shown in table 1.

TABLE 1.—*Rainfall at different places during critical periods of sugarcane ripening in Puerto Rico, 1929–32, and normal for 1899–1928*

Station	1929	1930			1931			1932		Normal, 1899–1928		
	Dec.	Jan.	Feb.	Dec.	Jan.	Feb.	Dec.	Jan.	Feb.	Dec.	Jan.	Feb.
	Inch	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*	*Inch*
Fajardo	1.80	8.74	1.45	4.82	1.75	6.63	2.48	4.43	0.60	4.86	3.50	4.01
Manati	3.08	4.57	1.28	5.86	.85	7.41	------	------	------	6.75	5.14	4.22
Toa Baja	5.50	7.07	3.46	5.75	1.30	5.76	2.48	[1]7.04	.87	------	------	------
Toa Alta	6.97	10.07	3.36	5.22	1.77	9.58	7.58	------	------	------	------	------
Arecibo	4.52	3.82	.41	------	4.10	.84	3.59	5.46	.50	6.07	5.44	4.67
Barceloneta	3.56	7.11	.70	8.57	1.75	------	5.61	7.61	.30	5.36	5.77	4.64
Isabela	1.12	2.49	.84	4.11	1.47	6.56	2.24	6.70	.29	4.62	3.43	2.69
Coloso	2.70	4.35	.55	2.25	.40	3.95	1.55	2.88	.15	2.60	2.13	2.09
Mayaguez	2.92	4.00	1.39	3.25	.80	3.89	.87	1.79	.16	2.62	1.89	2.20
San German	1.24	2.29	2.30	6.30	1.59	2.35	3.40	1.07	1.24	3.19	1.96	2.65
Anasco	2.49	2.84	------	3.89	.16	3.54	1.40	1.27	1.50	2.84	1.52	2.90
Cabo Rojo	1.80	3.78	1.15	2.75	1.65	2.52	3.03	------	------	2.80	2.15	2.98
Ponce	.97	5.13	2.94	.20	1.63	2.75	.16	------	------	1.22	1.01	.99
Aguirre	1.49	6.79	1.30	.34	.56	2.38	2.23	.62	------	1.86	1.38	1.57
Jayuya	------	------	------	------	------	------	------	------	------	2.45	2.25	2.20

[1] Record for Dorado near Toa Baja.

Table 1 shows that, with the exception of Arecibo and Barceloneta, along the entire north coast and in the eastern end of the island, including the area extending from Isabela to Fajardo, the rainfall was sufficient for continued growth and abnormally high for ripening during December 1930 and February 1931. These conditions,

[3] SPENCER, G. L. A HANDBOOK FOR CANE-SUGAR MANUFACTURERS AND THEIR CHEMISTS. Ed. 5, partly rewritten and enlarged, p. 483. New York and London. 1916.

[4] RICHEY, F. D. THE MOVING AVERAGE AS A BASIS FOR MEASURING CORRELATED VARIATION IN AGRONOMIC EXPERIMENTS. Jour. Agr. Research 32: 1161-1175. 1926.

[5] LOVE, H. H. A MODIFICATION OF STUDENT'S TABLE FOR USE IN INTERPRETING EXPERIMENTAL RESULTS. Jour. Amer. Soc. Agron. 16: 68–73. 1924.

unfavorable for ripening the 1931 crop, were still less favorable for the 1932 crop when the rainfall of the first two ripening months, December 1931 and January 1932, was abnormally high in the same area. Conditions for ripening are, however, seldom good on lowlands of the north coast, as the normal rainfall is 4 inches a month during the critical ripening period.

On account of its tendency to arrow profusely, P.O.J. 2878 is commonly harvested early in the grinding season before the period of maximum sucrose. This is unfavorable to P.O.J. 2878, a variety with tremendous vegetative vigor which does not ripen well under humid conditions. P.O.J. 2878 cannot be expected to give as high sugar yields along the north coast as in the San German Valley and along the south coast where the normal rainfall of the ripening period is light and the land is less subject to overflow.

The 1932 crop of the north coast was adversely affected by the heavy rainfall that followed the hurricane of September 1931, and much of the lowland remained under water for a week. Drainage, which is never good, was very poor during the fall of 1931. As a result, P.O.J. 2878 developed many water suckers which partly explains its very low sugar yields in 1932. Very few water sprouts developed on B.H. 10(12), the sugar yields of which were not so badly affected.

COMPARISON OF P.O.J. 2878 WITH OTHER SUGARCANE VARIETIES

GRAN-CULTURA TRIALS AT FAJARDO [6]

Usually sufficient rainfall is available near Fajardo and in the eastern end of the island for cane growing throughout the year, and periods of drought rarely last longer than a month. B.H. 10(12), which is the major cane variety, thrives on hillsides as well as on lowland. Except in the Loiza district, the mosaic disease has been controlled by systematic roguing; hence, superior drought resistance and resistance to mosaic—two of the principal advantages of P.O.J. 2878 over B.H. 10(12)—are not important factors near Fajardo. P.O.J. 2878 would have to outyield B.H. 10(12) by a distinct margin to justify its adoption by cane growers. A variety trial on humid lowland at Fajardo has been made, but no others have been reported from the east.

Table 2 compares the average production at Central Fajardo of three $\frac{1}{20}$-acre plats of 16-month gran-cultura P.O.J. 2878 and other varieties locally grown without irrigation and harvested in January 1932.

[6] Gran-cultura cane is planted in the summer or in the fall and harvested when 16 to 18 months old. Primavera cane is planted in the spring and usually harvested when only 12 to 14 months old.

TABLE 2.—*Results of gran-cultura sugarcane variety tests on estate Dolores on unirrigated clay and silty clay loam (fields nos. 234 and 235) of the Fajardo Sugar Co.,*[1] *1932*

Variety [2]	Acre yield of cane	Normal juice analyses [3]		Sugar in cane	Available [4] 96° sugar per acre
		Brix	Purity		
	Tons		*Percent*	*Percent*	*Tons*
C.O. 281	81.22	16.6	83.7	9.5	7.72
F.C. 916	75.56	17.0	84.5	9.9	7.48
P.R. 803	79.48	16.1	84.7	9.4	7.47
B.H. 10 (12) [5]	73.80	16.7	84.9	9.8	7.23
P.R. 826	83.67	15.2	81.4	8.3	6.94
F.C. 998	63.00	17.5	88.1	10.8	6.80
P.O.J. 2878	67.78	17.1	84.7	10.0	6.78
F.C. 915	67.67	16.7	86.0	10.0	6.77
P.O.J. 2725	83.22	14.8	81.4	8.1	6.74
P.O.J. 2883	63.67	16.8	84.6	9.8	6.24
S.C. 12/4	58.11	17.4	85.9	10.4	6.04
D. 433	62.56	16.3	81.8	9.0	5.63
P.R. 801	51.22	16.9	87.0	10.3	5.28
N.G. 15	45.67	17.2	86.0	10.3	4.70
F.C. 588	43.33	17.4	88.4	10.8	4.68
P.O.J. 2714	43.44	16.9	84.9	9.9	4.30
F.C. 306	34.11	17.9	89.1	10.8	3.68

[1] These data and the general field data were supplied by Rafael Bermudez, of the Fajardo Experiment Station.

[2] The varieties are designated by letters indicating the origin of the seedling.

[3] The analyses were obtained from the average of 3 special cars (6 tons), with the exception of plats of F.C. 588, F.C. 998, and F.C. 306 from which hand-mill analyses were made.

[4] Averages of three 1/20-acre plats cut in January when 16 months old and arranged in order of yields in tons of sugar per acre.

[5] In the case of B.H. 10(12) the average is based on 17 replications.

TABLE 3.—*Monthly rainfall during crop periods of variety trials at different places*

Location of variety trials

Central Fajardo, Dolores estate		Central San Vicente		Central Coloso		Central Pagan,[1] Hacienda Trinidad	
1930	*Inches*	1930	*Inches*	1930	*Inches*	1929	*Inches*
September	6.73	February	1.65	September		September	8.20
October	4.66	March	1.50	October	14.50	October	7.83
November	8.38	April	1.73	November	6.72	November	1.84
December	5.19	May	1.92	December	4.11	December	2.49
		June	2.62				
1931		July	1.57	1931		1930	
		August	4.42				2.84
January	1.45	September	6.17	January	.40	January	
February	4.45	October	4.15	February	3.95	February	5.88
March	2.39	November	5.58	March	3.40	March	5.35
April	7.98	December	6.69	April	7.30	April	5.97
May	8.31			May	16.70	May	6.85
June	12.02	1931		June	7.00	June	9.49
July	9.74			July	5.80	July	9.02
August	9.18	January	1.14	August	4.40	August	10.09
September	16.55	February	3.60	September	12.75	September	7.10
October	12.11			October	9.85	October	1.54
November	12.09			November	7.30	November	3.89
December	5.58			December	1.55	December	
				1932		1931	.16
				January	2.88	January	
				February	.15		
				March	.65		
				April			
Total	126.81		42.74		109.41		88.54
Average	7.93						

[1] Gran-cultura trial.

TABLE 3.—*Monthly rainfall during crop periods of variety trials at different places*—Continued

Location of variety trials							
Central Pagan,[2] Hacienda Trinidad		Central Pagan, Hacienda Dolores		Central Pagan, field Esperanza 3		San German Valley district, Russell & Co., Hacienda Filial Amor	
1931	*Inches*	1930	*Inches*	1930	*Inches*	1930	*Inches*
February	3.54	May	5.55	May	5.45	August	5.45
March	1.75	June	6.70	June	12.47	September	11.21
April	8.22	July	7.00	July	11.07	October	7.81
May	13.34	August	7.70	August	8.32	November	4.76
June	8.74	September	11.95	September	14.40	December	3.72
July	7.28	October	6.40	October	5.27		
August	10.82	November	1.85	November	1.65	1931	
September	8.98	December	4.50	December	3.04		
October	8.12					January	.82
November	3.46	1931		1931		February	2.58
December	1.40					March	1.40
		January	.10	January	.30	April	2.53
1932		February	3.30	February	3.21	May	20.30
		March	1.75	March	3.28	June	6.27
January	1.27	April	4.35	April	6.41	July	7.18
February	1.50	May	12.95	May	11.95	August	10.28
March	1.33	June	7.85	June	9.80	September	32.10
April	3.58	July	6.40	July	7.91	October	10.75
May	14.95	August	10.00	August	10.28	November	9.40
		September	8.60	September	8.76	December	2.65
		October	6.00	October	8.15		
		November	2.90	November	5.64	1932	
		December	1.40	December	2.00		
						January	1.15
Total	98.28		117.25		139.36		140.36

[2] First-ratoon trial.

Although the marked variability in cane production in different parts of the field made the data inconclusive, the results indicated the inferiority of P.O.J. 2878 to B.H. 10(12) in unirrigated gran cultura. The field may be considered as comparable to irrigated land, because the rainfall totaled 126 inches (table 3) and was ample at all times, except in January 1931. The soil was heavy, varying from clay to silty clay loam. Both here and in the variety trial under irrigation at Coloso, P.O.J. 2725 compared well with P.O.J. 2878 in yields of cane per acre, whereas S.C. 12/4 and P.O.J. 2714 were definitely inferior. The soils were essentially the same in both localities. The percentage of sugar in cane of P.O.J. 2878 was markedly superior to that of P.O.J. 2725, and this likewise held in the Filial Amor and Coloso, 1932, variety trials. Apparently under certain climatic and soil conditions P.O.J. 2878 is superior to P.O.J. 2725 in sucrose content. Despite unfavorable conditions for ripening, 17.6 inches of rain falling during the 2 months preceding harvest (table 3), P.O.J. 2878 gave a high percentage of sugar in cane, and the superiority of B.H. 10(12) was due entirely to higher cane production. F.C. 916, P.R. 803, and B.H. 10(12) showed only slight differences in sugar production. Co. 281 ranked first.

GENERAL FIELD PLANTINGS ALONG THE EAST COAST

The miscellaneous field data of the 1931–32 crops at Fajardo, shown in table 4, do not indicate any difference in percentage of sugar in cane between P.O.J. 2878 and B.H. 10(12).

TABLE 4.—*Results of sugarcane variety tests at Central Fajardo, 1931 and 1932*

DURING THE 1931 GRINDING SEASON

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (14-month primavera cut in June):					
Field no. 237 (3.9 acres), La Fe, unirrigated lowland loam [1] with heavy subsoil	*Tons* 35.00	*Percent* 20.0	*Percent* 87.3	*Percent* 12.6	*Tons* 4.41
B.H. 10(12) (12-month primavera cut in February):					
Field no. 250 (5.6 acres), La Fe, unirrigated lowland loam [1] with heavy subsoil	42.02	17.8	80.7	9.9	4.16
P.O.J. 2878 (10-month and 12-month primavera cut in April):					
Fields nos. 134 and 147 (5.93 acres), Santa Maria, unirrigated lowland silt loam	25.06	18.9	86.8	11.8	2.96
B.H. 10(12) (10-month primavera cut in April):					
Field no. 134 (6.16 acres), Santa Maria, unirrigated lowland silt loam	24.11	20.2	84.9	12.2	2.94
P.O.J. 2878 (13-month primavera cut in May):					
Fields nos. 53A and 68 (4.56 acres), Santa Rita, irrigated lowland silt loam	45.55	19.6	86.6	12.2	5.56
B.H. 10(12) (12-month primavera cut in April):					
Field no. 57 (1.74 acres), Santa Rita, irrigated lowland silt loam	50.22	19.6	85.3	11.9	5.98
B.H. 10(12) (12-month primavera cut in May):					
Field no. 54 (8.65 acres), Santa Rita, irrigated lowland silt loam	50.04	17.5	80.6	9.7	4.85
P.O.J. 2878 (12-month primavera cut in May):					
Field no. 68 (3.96 acres), Santa Rita, irrigated lowland silt loam	42.84	19.7	86.8	12.3	5.27
B.H. 10(12) (12-month primavera cut in May):					
Field no. 68 (1 acre), Santa Rita, irrigated lowland silt loam	48.94	[2]	[2]	[2]	[2]
B.H. 10(12) (12-month primavera cut in April):					
Field no. 57 (1.74 acres), Santa Rita, irrigated lowland silt loam	50.22	19.6	85.3	11.9	5.98
P.O.J. 2878 (18-month gran cultura cut in January):					
Fields nos. 326 and 327 (27.25 acres), San Pedro, irrigated lowland silt loam	37.31	18.5	82.8	10.7	3.99
B.H. 10(12) (18-month gran cultura cut in January):					
Field no. 322 (9.09 acres), San Pedro, irrigated lowland silt loam	67.24	16.5	82.0	9.4	6.32
B.H. 10(12) (18-month gran cultura cut in February):					
Field no. 324 (6.41 acres), San Pedro, irrigated lowland silt loam	64.56	17.7	86.0	10.9	7.04
P.O.J. 2878 (12-month first ratoons cut in June):					
Field no. 174 (0.44 acre), Paraiso, unirrigated slightly undulated land, silt loam	32.05	18.7	86.5	11.6	3.72
B.H. 10(12) (12-month first ratoons cut in June):					
Field no. 174 (3.46 acres), Paraiso, unirrigated slightly undulated land, silt loam	25.69	19.2	86.8	12.0	3.08
P.O.J. 2878 (13-month first ratoons cut in April):					
Field no. 4P (0.62 acre), Margarita, unirrigated slightly undulated hillside, silty clay loam	31.45	22.1	87.7	14.0	4.40
B.H. 10(12) (13-month first ratoons cut in April):					
Field no. 4P (3.4 acres), Margarita, unirrigated well-drained undulated hillside, silt loam	25.61	21.1	89.9	13.9	3.56

DURING THE 1932 GRINDING SEASON

P.O.J. 2878 (16-month gran cultura cut in January):					
Field no. 327 (6.85 acres), San Pedro, irrigated flat lowland silt loam [1]	42.76	15.06	82.3	10.5	4.49
P.O.J. 2878 (16-month gran cultura cut in January):					
Field no. 306 (1.55 acres), San Pedro, irrigated flat lowland silt loam	38.83	13.69	76.9	9.1	3.53
P.O.J. 2878 (16-month gran cultura cut in January):					
Field no. 336 (11.55 acres), San Pedro, irrigated flat lowland silt loam	33.21	14.87	81.7	10.3	3.42
B.H. 10(12) (16-month gran cultura cut in January):					
Field no. 352 (7.34 acres), San Pedro, irrigated flat lowland silt loam	55.88	15.38	85.9	11.0	6.15
B.H. 10(12) (16-month gran cultura cut in January):					
Field no. 308 (7.09 acres), San Pedro, irrigated flat lowland silt loam	48.48	16.19	86.1	11.1	5.38
P.O.J. 2878 (18-month gran cultura cut in February):					
Field no. 22 (5.15 acres), San Pedro, irrigated flat lowland silt loam	33.51	16.46	86.2	11.8	3.95

[1] Soils so designated by Rafael Bermudez, Fajardo Sugar Co.
[2] No record.

TABLE 4.—*Results of sugarcane variety tests at Central Fajardo, 1931 and 1932*—Continued

DURING THE 1932 GRINDING SEASON—Continued

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
B.H. 10(12) (18-month gran cultura cut in February):					
Field no. 20 (9.52 acres), San Pedro, irrigated flat lowland silt loam	*Tons* 53.07	*Percent* 16.24	*Percent* 85.9	*Percent* 11.6	*Tons* 6.16
B.H. 10(12) (18-month gran cultura cut in February):					
Field no. 19 (10.2 acres), San Pedro, irrigated flat lowland silt loam	43.85	13.22	82.1	9.2	4.03
P.O.J. 2878 (10-month primavera cut in April):					
Field no. 147 (5.25 acres), Santa Maria, unirrigated undulated, silt loam	24.20	16.70	87.0	12.0	2.90
B.H. 10(12) (10-month primavera cut in April):					
Field no. 134 (6.16 acres), Santa Maria, unirrigated undulated, silt loam	24.11	17.15	84.9	12.2	2.94
P.O.J. 2878 (13-month primavera cut in May):					
Field no. 68 (3.96 acres), Santa Rita, irrigated flat lowland brownish loam [1]	42.84	17.10	86.8	12.3	5.27
B.H. 10(12) (13-month primavera cut in May):					
Field no. 70 (11 acres), Santa Rita, irrigated flat lowland silt loam	50.49	15.90	85.0	11.3	5.71

Most of this cane was grown under irrigation on lowland silt loam. B.H. 10(12) was generally superior to P.O.J. 2878 on irrigated lowlands of gran cultura during both years. As in the variety trial, the apparent superiority of B.H. 10(12) was due to superior tonnage rather than to higher percentage of sugar in cane. In the 1931 crop the sugar yield of P.O.J. 2878 in seven fields ranged from 10.7 to 14 percent. In the 1932 crop the sugar yields were also very good, ranging, except in one field, from 10.3 to 12.3 percent. A 12–6–8 fertilizer, at the rate of 400 pounds per acre, was applied to the 1931 crop when it was 1½ months old; and ammonium sulphate, at the same rate, was applied 1½ to 2 months later. A 10–6–16 fertilizer, at the rate of 600 pounds per acre, was applied to the 1932 crop when it was 1 month old; and ammonium sulphate, at the rate of 400 pounds per acre, was applied 1 to 2 months later.

Almost the only other data available comparing P.O.J. 2878 with B.H. 10(12) in eastern end of Puerto Rico are from an unirrigated flat lowland clay soil at Central Roig near Humacao. On 10.95 acres P.O.J. 2878 averaged 63.9 tons of cane per acre and 6.14 tons of sugar per acre, whereas on 22.39 acres B.H. 10(12) averaged only 47.9 tons of cane per acre and 4.98 tons of sugar per acre. The sugar in cane of P.O.J. 2878 was only 9.62 percent, whereas that of B.H. 10(12) was 10.41 percent. B.H. 10(12) was, however, harvested January 30, 2 weeks later. The low sucrose content was apparently due to poor drainage rather than to early harvest, as 38.09 acres of P.O.J. 2878 gran cultura on an undulating, or semiupland, field at Central Roig, harvested January 15, averaged 49.8 tons of cane per acre with 11.31 percent of sugar in the cane.

Throughout the holdings of The Fajardo Sugar Co. P.O.J. 2878 in general field trials gave cane tonnage that usually barely equaled or was inferior to that of B.H. 10(12). Most of the data reported were from silty loam types of lowland and, with the exception of the variety trial, data on upland soils or soils of a heavy type are very meager.

In 2 of 3 comparisons on upland or rolling to undulating fields, P.O.J. 2878 was superior to B.H. 10(12). For upland soils of a heavy type in eastern Puerto Rico only the following instance has been reported: On 1 acre of clay on the farm of A. J. Sykes, near Bayamon, P.O.J. 2878 16-month first ratoons, cut in January 1933, produced 61.7 tons of cane and the sugar in cane was 11.47 percent. These very favorable data combined with those from the rolling to undulating fields at Fajardo and Humacao indicate that P.O.J. 2878 should be given a thorough trial on various soils in eastern Puerto Rico, particularly in upland areas.

PRIMAVERA AND FIRST-RATOON TRIALS AT CENTRALS CAMBALACHE AND SAN VICENTE

B.H. 10(12) is the major cane variety at Centrals Cambalache and San Vicente and on most of the north-coast lowlands. In the uplands S.C. 12/4 and P.O.J. 2725 are grown extensively. Along the entire north coast, mosaic constitutes more of a problem than along the irrigated south coast. The same amount of roguing is not equally effective on both coastal plains because of climatic differences and the fact that many fields of 100 percent infected P.O.J. 36 are still under cultivation in the north. It has not been found practicable to control the disease except in limited areas devoted to seed production. For these reasons a mosaic-resistant variety to replace the susceptible varieties B.H. 10(12) and S.C. 12/4 is much sought after, and P.O.J. 2878 was received with marked enthusiasm from the start. Results of a 2-year variety trial of primavera and first ratoons on $\frac{1}{20}$-acre plats at Cambalache are shown in table 5.

TABLE 5.—*Results of sugarcane variety tests at Central Cambalache, 1929–31* [1]

Culture and variety	Germination	Acre yield of cane	Available 96° sugar per acre	Yield of sugar in proportion to cane weight (averages)	Rainfall	
					Total	Two months before harvest
12½-month primavera plant cane cut in April 1930; unirrigated: [2]	*Percent*	*Tons*	*Tons*	*Percent*	*Inches*	*Inches*
P.O.J. 2878 (avergae of 8 replications)	86	59. 45±1. 00	6. 81±0. 17	11. 46	48. 00	3. 4
B.H. 10(12) (average of 7 replications)	90	41. 82±1. 24	4. 84± . 23	11. 56		
S.C 12/4 (average of 5 replications)	79	40. 17±1. 32	5. 17± . 13	12. 87		
12½-month first ratoons cut in June 1931: [3]						
P.O.J. 2878 (average of 8 replications)	--------	78. 34±1. 05	7. 39± . 13	9. 44	93. 03	24. 0
B.H. 10(12) (average of 7 replications)	--------	49. 92±1. 91	4. 19± . 18	8. 40		
S.C. 12/4 (average of 5 replications)	--------	56. 18±1. 42	4. 93± . 16	8. 76		

[1] RICHARDSON KUNTZ, P. LA PRODUCCIÓN DE NUEVAS VARIEDADES DE CAÑA Y SUS RESULTADOS EXPERIMENTALES. P.R. Dept. Agr. and Com. Insular Expt. Sta. Bul. 38:21. 1931.
[2] Soil type not identified.
[3] Much of the P.O.J. 2878 lodged, but arrowing and rottenness were not observed.

In the primavera trial P.O.J. 2878 exceeded B.H. 10(12) in yield by a ton or more of sugar per acre in all plats except one, which showed a margin of superiority of 0.88 ton. Only 3.4 inches of rain fell during the 2 months preceding harvest and only 0.9 inch during the month of harvest. Under these conditions the proportion of sugar in cane for P.O.J. 2878 was 11.46 percent, approximately that of B.H. 10(12), though considerably lower than that of S.C. 12/4.

In the first ratoons the three varieties gave low percentages of sugar in cane owing apparently to abnormally high rainfall, 24 inches, during the 2 months preceding harvest. Contrary to expectations, however, P.O.J. 2878 was superior to the other varieties, with 9.44 percent of sugar as opposed to 8.4 percent for B.H. 10(12), and 8.76 percent for S.C. 12/4.

The contrast in cane production was striking for both crops. During the 1929–30 primavera-crop period, when the rainfall was light, P.O.J. 2878 exceeded B.H. 10(12) in yield by an average of over 17 tons of cane per acre. The superiority was uniform; the nearest B.H. 10(12) approached P.O.J. 2878 in cane production was in plat no. 29, and there the adjoining plat of the latter was superior by 11.4 tons per acre of cane. During the 1930–31 crop period, when the rainfall was high, the first ratoon of P.O.J. 2878 was superior to B.H. 10(12) in cane production by 28.42 tons per acre, a much wider margin than in the primavera crop. During the two crops P.O.J. 2878 produced 4.1 tons more sugar per acre than did S.C. 12/4, and 5.17 tons more than did B.H. 10(12). These favorable results are not, however, applicable to gran-cultura plantings.

Results of 13-month primavera, grown at Central San Vicente under irrigation on $\frac{1}{20}$-acre plats and cut in March 1931 are shown in table 6.

TABLE 6.—*Results of sugarcane variety tests at Central San Vicente (Colonia Cayures, Vega Baja), 1931* [1]

Culture and variety	Germination	Acre yield of cane	Available 96° sugar per acre	Sugar in cane (average)
13-month primavera cut in March 1931; irrigated: [2]	*Percent*	*Tons*	*Tons*	*Percent*
P.O.J. 2878 (average of 10 replications)	92	48.90±1.34	5.435±0.178	11.10
F.C. 916 (average of 10 replications)	84	43.78±1.68	4.893±.187	11.18
S.C. 12/4 (average of 10 replications)	78	34.72±1.03	3.958±.128	11.74
B.H. 10(12) (average of 32 replications)		43.10±0.80	4.856±.079	11.27

[1] RICHARDSON KUNTZ, P. LA PRODUCCIÓN DE NUEVAS VARIEDADES DE CAÑA Y SUS RESULTADOS EXPERIMENTALES. P.R.Dept.Agr. and Com. Insular Expt. Sta. Bul. 38:23. 1931.

[2] Soil type not identified.

P.O.J. 2878 exceeded B.H. 10(12) in yield by 5.8 tons of cane per acre and by 0.579 ton of sugar per acre. The sugar in cane of P.O.J. 2878 (11.10 percent) was practically the same as that of B.H. 10(12). Under the conditions of scant rainfall during the first 2 months of growth (table 3), P.O.J. 2878 gave an excellent germination and grew better than did the other varieties. Both F.C. 916 and S.C. 12/4 were inferior to P.O.J. 2878 in sugar production. A 12–8–5 fertilizer, at the rate of 600 pounds per acre, was applied to the crop April 4, 1930. Irrigation water was not measured, but was applied once during each of the months of April, May, July, September, and October.

GENERAL FIELD PLANTINGS ALONG THE NORTH COAST

Data on general field plantings for the north coast have been placed under four heads: Gran cultura on friable alluvial soils; gran cultura on upland soils with good surface drainage; gran cultura on lowland soils with inadequate artificial or surface drainage, and first ratoons.

In 1932 sugar yields were very low at Central Constancia and the juices of P.O.J. 2878 were clarified with great difficulty. It was found necessary to grind cane of other varieties at the same time as that of P.O.J. 2878; consequently, adjoining fields were harvested simultaneously, and sugar yields of the different varieties are comparable. The lowlands of both Centrals Carmen and Constancia were flooded by the September 1931 hurricane, and most of the lowlands were under water for nearly a week.

At Cambalache and at Constancia a 12–6–5 fertilizer at the rate of 600 pounds per acre was applied at 2 months, and ammonium sulphate at the same rate was applied at 4 months. At Carmen 400 pounds of each of the same kind of fertilizers was applied.

Gran cultura on friable alluvial soils.—The 1932 data of gran cultura on the more friable alluvial soils are grouped in table 7.

TABLE 7.—*Results of sugarcane variety tests on friable alluvial soil at Centrals Carmen and Plazuela, 1932*

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (16-month gran cultura cut in December):					
Field no. 2 (16.55 acres), Carmen, irrigated well-drained lowland loam	*Tons* 48.00	*Percent* 11.59	*Percent* 79.80	*Percent* 8.39	*Tons* 4.030
B.H. 10(12) (16-month gran cultura cut in January):					
Field no. 3 (19 acres), Carmen, irrigated well-drained lowland loam to silt loam	67.00	10.72	75.50	7.88	5.280
P.O.J. 2878 (16-month gran cultura cut in January):					
Field Kailan (20 acres), Luisa,[1] irrigated lowland loose loam [2]	77.28	11.58	77.70	8.31	6.420
P.O.J. 2878 (17-month gran cultura cut in January and February):					
Field Tetanos (6 acres), Catalana,[1] unirrigated lowland loose loam [2]	95.29	11.80	78.10	8.50	8.100
P.O.J. 2878 (19-month gran cultura cut in December):					
Field Palo Dan (10 acres), Catalana, irrigated lowland loose sandy loam [2]	108.50	11.99	78.90	8.28	8.980

[1] Luisa and Catalana belong to Central Plazuela.
[2] Soils so designated by the field superintendent of Central Plazuela.

At Central Carmen P.O.J. 2878 produced 1.25 tons of sugar less than did B.H. 10(12) on a friable loam with good drainage. Four large fields, totaling over 50 acres, of P.O.J. 2878 on poorly drained friable alluvial soil at Central Plazuela gave sugar in cane ranging from 8.3 to 8.7 percent. Friable alluvial soils along the north coast are apparently unsuited to the cultivation of gran cultura P.O.J. 2878.

Gran cultura on upland soils.—The results of the 1932 gran-cultura tests with P.O.J. 2878 on upland with good surface drainage and without irrigation are given in table 8.

TABLE 8.—*Results of sugarcane variety tests on upland soils with good surface drainage at Centrals Constancia, Carmen, and Pagan, 1932*

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (17-month gran cultura cut in January):	*Tons*	*Percent*	*Percent*	*Percent*	*Tons*
Field no. 29 (0.88 acre), Maricao,[1] unirrigated upland clay	41.00	14.57	82.40	11.09	4.55
S.C. 12/4 (18-month gran cultura cut in January):					
Field no. 29 (8.83 acres), Maricao, unirrigated upland clay	24.00	12.14	80.30	9.51	2.28
P.O.J. 2878 ([2] gran cultura cut in January):					
Field no. 1 (5 acres), Mucarabones,[3] unirrigated hillside sandy loam	61.29			10.08	6.18
S.C. 12/4 ([2] gran cultura cut in December to January):					
Field no. 9 (17.5 acres), Mucarabones, unirrigated hillside sandy clay	52.10			9.56	4.98
P.O.J. 2878 (19½-month gran cultura cut in February):					
Field no. 7 (13 acres), Mucarabones, unirrigated hillside clay and stony clay and sandy loam (equal amounts)	62.74			10.22	6.42
S.C. 12/4 (19½-month gran cultura cut in February):					
Field no. 6 (15.5 acres), Mucarabones, unirrigated hillside clay and stony clay and sandy loam (equal amounts)	55.14			9.50	5.24
P.O.J. 2878 (18-month gran cultura cut in February):					
Field of 2 plats (⅛ acre), Trinidad,[4] unirrigated upland compact clay [5]	59.20	15.60	82.30	11.98	7.08
P.O.J. 2725 (18-month gran cultura cut in February):					
Field of 2 plats (⅛ acre), Trinidad, unirrigated upland compact clay [5]	60.00	12.50	77.90	9.34	5.61
P.O.J. 2878 ([2] gran cultura cut in January):					
Field no. 9 (6 acres), Campanilla,[6] semiupland clay loam	29.28			8.33	2.44
P.O.J. 2878 ([2] gran cultura cut in January):					
Field no. 12 (14.25 acres), Campanilla, semiupland clay loam	31.95			8.32	2.66
P.O.J. 2878 (16-month gran cultura cut in January):					
Field no. 39 (10 acres), San Antonio,[7] irrigated well-drained upland slope sandy loam	27.00	13.18	78.00	9.65	2.60
S.C. 12/4 (15-month gran cultura cut in January):					
Field no. 36 (31 acres), San Antonio, irrigated well-drained upland slope sandy loam	33.00	12.79	82.60	10.73	3.54

[1] Maricao belongs to Central Carmen.
[2] Age of cane not given as data not available.
[3] Mucarabones belongs to Central Constancia.
[4] Trinidad belongs to Central Pagan.
[5] Soils so designated by E. H. Barrow, district field superintendent of Russell & Co., Central Pagan.
[6] Campanilla belongs to Central Constancia.
[7] San Antonio belongs to Central Carmen.

Data on a field of stiff clay at Central Pagan, Anasco, are included with those of the north coast because of the similarity of the reaction of P.O.J. 2878 which, in these widely separated districts, appears to be particularly well adapted to upland soils. With the exception of the more friable clay loam and sandy loam fields the percentage of sugar in cane was satisfactory, ranging from 10 to 12 percent, and in every instance was superior to that of the competing variety grown in the same or in adjoining fields. P.O.J. 2878 was superior in sugar production, usually by a wide margin of approximately 1½ tons of sugar per acre. These data are in sharp contrast with those of gran cultura either on more friable flooded lowlands, or on lowlands where the soil was heavy to fairly heavy (table 9), and where the sugar in cane of P.O.J. 2878 ranged from 6.85 to 9.57 percent, and sugar production was inferior to that of B.H. 10(12), the nearest competing variety.

Gran cultura on lowlands with inadequate artificial or surface drainage.—Along the north coast gran cultura P.O.J. 2878 on lowlands with inadequate artificial or surface drainage gave, as shown in table 9, good cane production, but generally a very low sucrose content. Considerable risk is apparently involved in cropping P.O.J. 2878, particularly gran cultura, on most lowlands of this area.

TABLE 9.—*Results of sugarcane variety tests on soils with inadequate artificial or surface drainage at Centrals Cambalache, Constancia, and Carmen, 1932*

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 ([1] gran cultura cut in December):					
Field no. 29 (11.75 acres), Constancia,[2] irrigated lowland silt loam	*Tons* 51.34	*Percent*	*Percent*	*Percent* 7.88	*Tons* 4.09
B.H. 10 (12) ([1] gran cultura cut in December to January):					
Field no. 33 (30 acres), Constancia, irrigated lowland silt loam	53.74			9.06	4.87
P.O.J. 2878 ([1] gran cultura cut in January):					
Fields no. 34 (31.5 acres), Constancia, irrigated lowland silt loam	59.31			8.20	4.86
B.H. 10 (12) ([1] gran cultura cut in December to January):					
Fields nos. 30, 31 (38.25 acres), Constancia, irrigated lowland silt loam	60.10			9.18	5.52
P.O.J. 2878 (17-month gran cultura cut in December):					
Field no. 11 (16.25 acres), Claras,[3] twice irrigated poorly drained lowland daga [4] compact clay	75.00	12.52	79.30	9.11	6.83
P.O.J. 2878 (17-month gran cultura cut in January):					
Field no. 12 (16 acres), Claras, twice irrigated poorly drained lowland daga [4] compact clay	64.00	13.08	80.20	9.57	6.12
B.H. 10 (12) (19-month gran cultura cut in January):					
Field no. 5 (7.5 acres), Claras, twice irrigated poorly drained lowland daga [4] compact clay	60.00	13.33	83.90	10.25	6.15
P.O.J. 2878 ([1] gran cultura cut in January):					
Field no. 21 (8.5 acres), Campanillas,[5] unirrigated poorly drained lowland silty clay	54.29			8.50	4.62
S.C. 12/4 ([1] gran cultura cut in December to January):					
Field no. 38 (28 acres), Campanillas, unirrigated poorly drained lowland silt clay	53.38			8.20	4.38
P.O.J. 2878 ([1] gran cultura cut in January):					
Field no. 23 (9.25 acres), Campanillas, unirrigated poorly drained lowland silty clay	51.16			6.85	3.50
P.O.J. 2878 (16-month gran cultura cut in December):					
Field no. 205 (22.8 acres), Monserrate, Vega Baja,[6] irrigated lowland silty clay loam	54.00	11.96	76.00	8.75	4.73
B.H. 10 (12) (16-month gran cultura cut in January):					
Field no. 206 (22.1 acres), Monserrate, Vega Baja, irrigated lowland silty clay loam	61.00	11.87	78.30	8.93	5.45
P.O.J. 2878 (16-month gran cultura cut in January):					
Field no. 5 (15.2 acres), Monserrate, Dorado,[6] unirrigated poorly drained lowland silt loam	55.00	11.04	75.70	7.98	4.39
B.H. 10 (12) (16-month gran cultura cut in January):					
Field no. 19 (17.5 acres), Monserrate, Dorado, unirrigated poorly-drained lowland silt loam	48.00	12.34	79.30	9.42	4.56

[1] Where age of cane is not given data were not available.
[2] Constancia belongs to Central Constancia.
[3] Claras belongs to Central Cambalache.
[4] Soils so designated by Emilio Rola, Central Cambalache.
[5] Campanillas belongs to Central Constancia.
[6] Monserrate, Vega Baja, and Monserrate, Dorado belong to Central Carmen.

First ratoons along the north coast.—Data on first ratoons of P.O.J. 2878 on lowlands at Centrals Carmen and Constancia are given in table 10.

TABLE 10.—*Results of first ratoons sugarcane variety tests on lowlands at Centrals Constancia and Carmen, 1932* [1]

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (first ratoons [2] cut in January):					
Field no. 18 (16 acres), Constancia,[3] irrigated poorly drained silt loam [4]	*Tons* 35.94	*Percent*	*Percent*	*Percent* 8.54	*Tons* 3.07
B.H. 10 (12) (first ratoons [2] cut in December to January):					
Field no. 27 (5 acres), Constancia, irrigated poorly drained silt loam	41.23			9.16	3.78
P.O.J. 2878 (first ratoons [2] cut in January):					
Field no. 12 (14.25 acres), Campanillas,[5] irrigated poorly drained clay loam	32.15			10.10	3.25

[1] The field data from Central Constancia were supplied by Manuel del Valle, mill manager, and the data from Central Carmen by Aristides Gonzalez, field superintendent.
[2] Where age of cane is not given no data were available.
[3] Constancia belongs to Central Constancia.
[4] Poorly or fairly well-drained refers to adequacy of ditching for surface and artificial drainage.
[5] Campanilla belongs to Central Constancia.

TABLE 10.—*Results of first ratoons sugarcane variety tests on lowlands at Centrals Constancia and Carmen, 1932*—Continued

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (first ratoons [2] cut in January):					
Field no. 9 (5.75 acres), Campanillas, irrigated poorly drained clay loam (low-lying)	*Tons* 32.35	*Percent*	*Percent*	*Percent* 8.85	*Tons* 2.86
P.O.J. 2878 (first ratoons [2] cut in March):					
Field no. 1 (1.75 acres), Campanillas, irrigated poorly drained silt loam	27.97			8.76	2.45
P.O.J. 2878 (9-month first ratoons cut in March):					
Field no. 4 (4.8 acres), Monserrate, Dorado,[6] irrigated poorly drained silt loam	46.00	10.57	75.80	7.80	3.56
B.H. 10 (12) (9-month first ratoons cut in April):					
Field no. 5 (3.79 acres), Monserrate, Dorado, irrigated poorly drained silt loam	16.00	14.64	81.50	11.09	1.80
P.O.J. 2878 (12-month first ratoons cut in March):					
Field no. 14 (3.63 acres), Monserrate, Vega Baja,[6] unirrigated fairly well-drained loam	55.00			8.76	4.80
B.H. 10 (12) (12-month first ratoons cut in February):					
Field no. 14 (13 acres), Monserrate, Vega Baja, unirrigated fairly well-drained loam	37.00			8.24	3.06

[2] Where age of cane is not given no data were available.
[6] Monserrate, Dorado, and Monserrate, Vega Baja, belong to Central Carmen.

The reaction of the first ratoons was the same as for gran cultura. Sucrose contents generally were unsatisfactory and inferior to those of B.H. 10(12) on poorly drained soils, regardless of type. In the only instance where a satisfactory sucrose content was secured, the soil was a clay loam of a semiupland type. This favorable result was duplicated on the same type of soil in the 1933 crop of Central Constancia; among 13 fields of P.O.J. 2878 ratoons reported upon, 13.25 acres of the crop on this soil, harvested in March, averaged the highest sugar in cane, 12.45 percent, and the highest in sugar production, 3.87 tons per acre (field no. 60, Rosario, Dorado). The average sugar in cane for the 13 fields was 10.1 percent and 4 lowland fields ranged between 7 and 9 percent. On a well-drained lowland loam at Central Carmen, P.O.J. 2878 in one instance exceeded B.H. 10(12) by 0.74 ton of sugar per acre. The following explanation is offered by Ray C. Roberts for the low juices of P.O.J. 2878 on certain soils:

> If P.O.J. 2878 is thrown down by wind or by rain on hill land, it will fail to germinate, because the surface is seldom wet enough to enable the variety to take root at the joints. On the other hand, on some lowland soils, because of the frequent flooding, the surface is wet enough for the cane to germinate as soon as it comes in contact with the ground, and many water suckers then develop and lower the sucrose content.

In general, the results both in gran cultura and ratoons offer no encouragement for the cropping of P.O.J. 2878 on friable or flooded, alluvial lowlands of the north coast. Had the experimental primavera crops of Centrals Cambalache and San Vicente been duplicated in gran cultura, both on friable alluvial and on imperfectly drained clays, before the very rapid extension of P.O.J. 2878, the financial losses resulting from low percentage of sugar in cane could probably have been avoided.

P.O.J. 2878 should not be planted on poorly drained or on friable alluvial soils subject to overflow. In this connection, E. W. Brandes,[7] of the Division of Sugar Plant Investigations, Bureau of Plant In-

[7] In personal letter to the Chief of Office of Experiment Stations.

dustry, United States Department of Agriculture, has called attention to the adaptability in South Africa and the Philippines of P.O.J. 2878 to well-drained heavy clay soils, particularly of lateritic or ancient volcanic origin, and that this cane was originally selected at Pasoeroean on such a soil type on which it has since given the best performance in Java. Dr. Brandes also observed that loose alluvial and other soil types almost invariably give either poor tonnage, or good tonnage and poor sugar. These observations are in harmony with results obtained in Puerto Rico.

GRAN-CULTURA TRIAL AT CENTRAL COLOSO

In September 1930, P.O.J. 2878, in comparison with 11 other varieties of sugarcane, was planted on irrigated silty clay flat lowland near Coloso. The soil is more friable than are most of the lowland soils near Coloso, but is, nevertheless, rather compact and requires good drainage. The soil in plats of groups 7 and 8 was clay, calcareous phase. The weather was very dry (table 3) and irrigation water was applied until 3 months preceding harvest. The varieties were replicated seven times in $\frac{1}{20}$-acre plats and were harvested in April 1932 when 18½ months old. All plats fronted on the same margin of the field and consisted of two rows 135 centimeters (4½ feet) apart. The spacings were 1 meter apart in the row and three cuttings were planted to a hole. The narrow plats and the method of planting gave some advantage to the more prolific canes, P.O.J. 2725, P.O.J. 2878, and Mayaguez nos. 28 and 49. A 13–10–12 fertilizer, at the rate of 500 pounds per acre, was applied to the crop when it was 2 months old; and ammonium sulphate, at the rate of 600 pounds per acre, was applied 1½ months later. The results in tonnage of cane and of sugar are given in table 11 and summarized in table 12.

TABLE 11.—*Results of gran-cultura sugarcane variety tests on irrigated silty clay to clay lowland at Central Coloso*

AVAILABLE 96° SUGAR PER ACRE [1]

Variety	Yields for plat group [2]—								Average tonnage	Increase (+) or decrease (−) in tonnage over general average	D_2
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
M. 3	5.93	4.46	5.03	6.68	5.67	5.04	5.66	4.17	5.330	−0.119	0.014
M. 7	4.95	5.23	5.25	5.82	5.11	6.95	4.05	4.84	5.275	−.254	.064
M. 28	6.30	6.42	6.27	7.18	7.00	8.10	6.03	6.34	6.705	+1.176	1.515
M. 42	3.49	5.12	5.88	6.92	5.39	6.58	4.38	4.74	5.313	−.216	.046
M. 49	5.99	5.42	4.88	6.72	6.41	6.55	5.95	7.06	6.122	+.593	.352
P.O.J. 2714	3.23	3.37	2.48	4.48	3.21	3.59	1.72	2.44	3.065	−2.464	6.071
P.O.J. 2725	6.36	6.35	6.33	5.39	6.16	7.48	5.02	4.94	6.004	+.475	.226
P.O.J. 2878	6.20	6.68	6.54	7.22	7.10	8.12	6.01	6.72	6.824	+1.295	1.677
S.C. 12/4	4.77	5.65	4.85	6.08	4.65	5.09	3.99	5.61	5.086	−.443	.196
B.H. 10(12)	6.85	7.28	7.45	6.73	6.64	7.44	5.51	6.14	6.755	+1.226	1.503
P.R. 801	3.20	4.73	4.74	4.37	3.60	4.47	2.69	2.99	3.848	−1.681	2.826
P.R. 826	5.64	6.70	6.30	6.32	5.49	6.63	5.74	5.29	6.014	+.485	.235
Average	5.25	5.62	5.50	6.16	5.54	6.34	4.73	5.11			

[1] The probable error of the difference between the average tonnage acre yields of sugar of any 2 varieties= ±0.219 ton.

[2] Groups 1 to 6, inclusive, are silty clay; groups 7 and 8 are clay calcareous phase.

TABLE 11.—*Results of gran-cultura sugarcane variety tests on irrigated silty clay to clay lowland at Central Coloso*—Continued

ACRE YIELD OF CANE [3]

Variety	Yields for plat group—								Average tonnage	Increase (+) or decrease (−) in tonnage over general average	D_2
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
M. 3	44.80	32.60	36.60	50.70	43.10	39.50	43.20	32.50	40.37	−2.44	
M. 7	36.10	38.70	39.80	44.30	40.40	50.80	32.90	38.00	40.12	−2.69	
M. 28	47.00	45.80	49.70	53.40	51.40	59.80	46.10	49.80	50.35	+7.54	
M. 42	23.50	35.40	43.40	48.60	39.10	47.40	33.00	35.80	38.27	−4.54	
M. 49	41.80	36.70	33.30	49.00	46.40	50.20	43.20	50.80	43.93	+1.12	
P.O.J. 2714	27.80	29.90	23.80	39.30	29.60	37.06	19.40	25.70	29.07	+13.74	
P.O.J. 2725	48.40	53.50	50.40	49.20	52.00	62.60	44.10	43.80	50.50	+7.69	
P.O.J. 2878	45.90	51.20	47.70	53.70	52.10	61.40	45.70	48.00	50.71	+7.90	
S.C. 12/4	35.00	41.60	36.10	44.60	36.10	38.80	31.10	42.20	38.19	−4.62	
B.H. 10(12)	50.30	52.06	55.60	48.70	47.40	54.60	42.20	48.60	49.93	+7.12	
P.R. 801	26.20	38.40	39.10	35.70	30.80	38.00	24.80	29.40	32.80	+10.01	
P.R. 826	46.70	57.70	54.70	54.80	48.80	54.00	44.40	46.90	51.00	+8.19	
Average	39.45	42.80	42.52	47.67	43.10	49.51	37.51	40.96			

[3] The probable error of the difference between the average acre yield of cane of any 2 varieties= ±1.58 tons.

TABLE 12.—*Summary of results of gran-cultura sugarcane variety tests on irrigated silty clay and clay calcareous phase, at Central Coloso, 1930–32* [1]

Variety	Acre yield of cane [2]	Normal juice analyses		Sugar in cane	Available 96° sugar per acre [3]	Tons of cane per ton of sugar
		Sucrose	Purity			
	Tons	*Percent*	*Percent*	*Percent*	*Tons*	*Tons*
P.O.J. 2878	50.71±3.89	17.34	84.89	13.42	6.824±0.492	7.45
Mayaguez 28	50.35±3.36	17.24	85.82	13.41	6.705± .481	7.44
B.H. 10(12)	49.93±3.21	17.45	85.13	13.52	6.755± .503	7.30
Mayaguez 49	43.93±5.17	17.81	87.39	13.95	6.122± .562	7.17
P.O.J. 2725	50.50±4.15	15.47	83.39	11.87	6.004± .665	8.42
P.R. 826	51.00±4.34	15.31	83.89	11.81	6.014± .478	8.47
Mayaguez 3	40.37±5.07	17.25	84.76	13.21	5.330± .677	7.57
Mayaguez 42	38.27±6.32	17.76	86.94	13.90	5.313± .880	7.19
Mayaguez 7	40.12±5.04	17.05	83.90	13.11	5.275± .561	7.62
S.C. 12/4	38.19±3.81	17.12	85.48	13.30	5.086± .521	7.52
P.R. 801	32.80±5.00	15.52	82.32	11.67	3.848± .724	8.57
P.O.J. 2714	29.07±4.89	14.31	76.26	10.48	3.065± .638	9.54

[1] Planned and the cane harvested through the cooperation of Francisco Colon Moret, formerly field superintendent Central Coloso, and Herminino Acosta, of the Insular Department of Agriculture, and Alfonso Dozal, of Central Coloso.

[2] The probable error of the difference between the average tonnage acre yields of sugar of any 2 varieties= ±0.219 ton.

[3] The probable error of the difference between the average acre yield of cane of any 2 varieties= ±1.58 tons.

In cane production no significant differences were observed in P.O.J. 2878, B.H. 10(12), P.O.J. 2725, Mayaguez 28, and P.R. 826. All produced approximately 50 tons of cane per acre and were significantly superior to S.C. 12/4, P.O.J. 2714, P.R. 801, and Mayaguez nos. 3, 7, 42, and 49. P.O.J. 2714 was a failure, producing approximately 20 tons per acre of cane less than did P.O.J. 2878. The superior cane production of P.O.J. 2878, Mayaguez 28, and B.H. 10(12) is illustrated in figure 2. Each car carried the cane production of a 1/20-acre plat. The cars were arranged in the same order as were the plats. P.O.J. 2725 and P.R. 826 also gave good cane production,

but both varieties were inferior in percentage of sugar in cane. The higher cane tonnages of P.O.J. 2878 and Mayaguez 28 were due largely to their prolific stooling habit. These varieties averaged 15 canes per stool, about half again as many as S.C. 12/4 and Mayaguez 42.

All varieties, except B.H. 10(12) and Mayaguez 28, were significantly inferior to P.O.J. 2878 in sugar production. Owing to higher sucrose contents, these three leading varieties produced about 0.75 ton more sugar per acre than did either P.O.J. 2725 or P.R. 826. This is shown graphically in figure 3.

S.C. 12/4 was decidedly inferior in production to P.O.J. 2878. Considering the advantage of the latter, due to mosaic resistance and

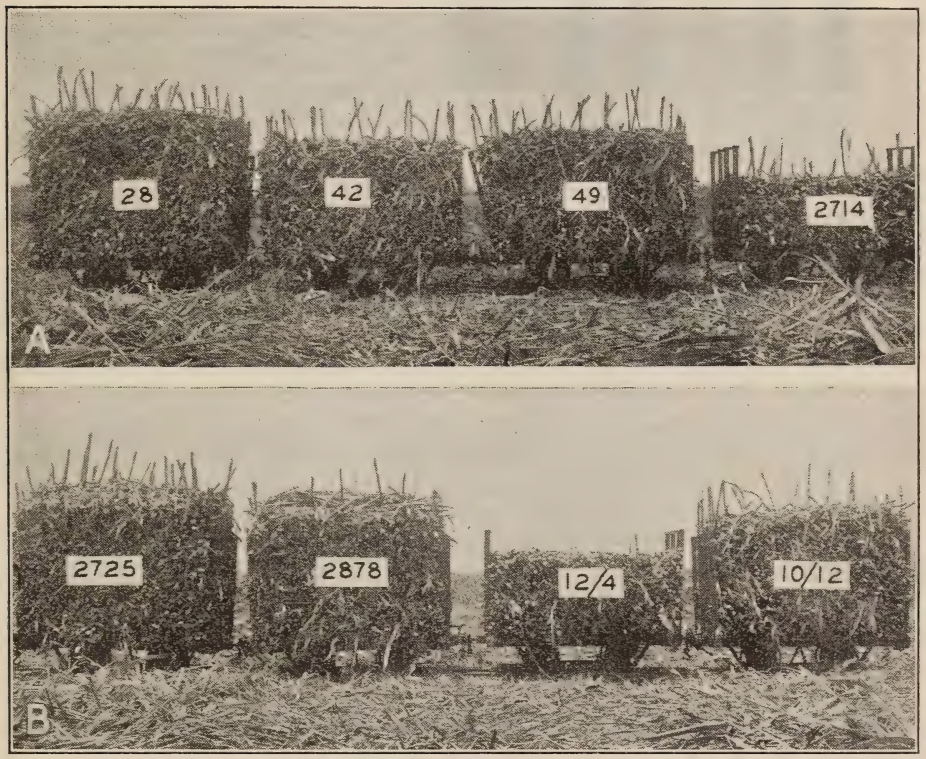

FIGURE 2.—P.O.J. 2878 compared well with Mayaguez 28, P.O.J. 2725, and B. H. 10(12) in cane production at Coloso. The cars were arranged in the same order as were the plats. Each car carried the cane of a ½o-acre plat. Mayaguez 28, P.O.J. 2878, and B.H. 10(12) showed little difference in either cane production or sucrose content.

prolific stooling, S.C. 12/4 is hardly likely to be able to compete with it in ratoon crops.

Quality of juice.—The 12 varieties fall into two groups for quality of juice. Eight (B.H. 10(12), S.C. 12/4, P.O.J. 2878, and the 5 Mayaguez varieties nos. 3, 7, 28, 42, and 49) had over 17 percent of sucrose; and 4 (P.O.J. 2725, P.R. 801, P.R. 826, and P.O.J. 2714) had inferior juices ranging from 14 to 15.5 percent of sucrose. The duration of the crop, 18½ months, and late harvest with 3 months of dry weather preceding (table 3) favored ripening. Both Mayaguez nos. 42 and 49 were consistently superior to B.H. 10(12). Mayaguez 28 was, except on plat no. 8, almost identical with B.H. 10(12) and P.O.J. 2878 in percentage of sugar in cane. Mayaguez nos. 3 and 7

and S.C. 12/4 were slightly inferior to Mayaguez 28. The contrast between Mayaguez 28 and P.O.J. 2725 is rather marked; in 6 of 8 plats the sugar in cane of Mayaguez 28 was superior by a margin of 1 to 2 percent. The eighth plat of each variety lay at the extreme right of the field where drainage was not good, a fact that explains the drop in sucrose content. In ratio of tons of cane per ton of sugar, P.O.J. 2878 equaled B.H. 10(12). It was necessary to grind 8.42 tons of P.O.J. 2725 canes to produce a ton of sugar, a ton more than was required with P.O.J. 2878. With an average of 85.8 percent the purity of Mayaguez 28 somewhat exceeded the purity of both B.H. 10(12) and P.O.J. 2878. This offset the slight advantage in cane production of the latter variety.

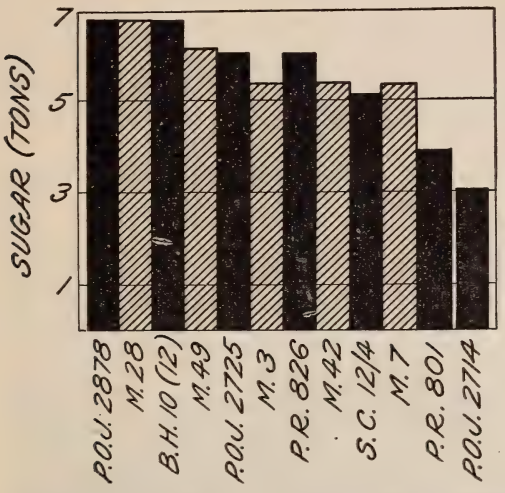

FIGURE 3.—P.O.J. 2878 at Coloso exceeded in sugar production all varieties excepting B.H. 10(12) and Mayaguez 28. The striped columns represent average tons of sugar per acre for Mayaguez seedlings on eight 1/20-acre plats; and the black columns the sugar productions of the other varieties.

Trashing.—Of the Mayaguez canes, nos. 3 and 28 trashed the easiest, both comparing well in this respect with P.O.J. 2878. This observation was confirmed by examination of the sprouted roots and clinging leaf pieces on the joints of 100 pieces of cane per variety. Less than half as many leaf pieces clung to the canes of Mayaguez 3 as to those of P.O.J. 2878, as shown in table 13.

TABLE 13.—*Comparative differences in prolificacy and quality of canes of 18½-month gran-cultura sugarcane variety test at Coloso, April 1932* [1]

Variety	Canes		Hollow cane pieces (per 1,000 observed)		Clinging leaf pieces per 100 harvested cane pieces	Joints with sprouted roots per 100 harvested cane pieces	Internodes examined by ordinary method	Proportion with borer holes [2]	Internodes examined by Aguirre method	Proportion with borer holes [3]	Average proportion of internodes with borer holes
	Per stool (average of 8)	With dry top rot (per 2,000 pieces	Total	Average per plat							
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Percent*	*Number*	*Percent*	*Percent*
P.O.J. 2878	15.0	93	72	36.0	52	112	1,538	11.7	1,828	10.1	10.9
Mayaguez 28	14.9	82	29	14.5	58	120	704	19.6	1,806	13.0	16.3
B.H. 10(12)	11.7	56	0	0.0	37	230	699	13.7	1,776	10.8	12.3
Mayaguez 49	12.0	90	22	11.0	97	75	838	10.6	1,731	9.5	10.1
P.O.J. 2725	12.2	97	68	34.0	83	132	1,568	20.2	2,132	18.3	19.3
Mayaguez 3	12.0	103	25	12.5	21	82	470	18.3	1,338	13.9	16.1
Mayaguez 42	9.1	47	17	8.5	141	114	734	17.2	1,806	9.8	13.5
P.R. 826	9.2						646	14.2	2,017	12.2	13.2
Mayaguez 7	13.0	105	21	10.5			500	12.8	1,809	7.3	10.1
S.C. 12/4	11.5	104	10	5.0	29	98	1,126	11.9	1,263	11.4	11.7
P.R. 801	7.3						521	14.0	1,610	12.5	13.3
P.O.J. 2714	9.6	167	239	119.5	15	143	500	12.8	1,809	7.3	10.1

[1] Herminio Acosta, of the Insular Department of Agriculture, assisted in gathering these data and in supervising the harvest.

[2] Under the ordinary method all infested and healthy internodes were counted in canes, in a 40-foot row, taken 10 feet of each of 4 different plats per variety.

[3] Under the Aguirre method all the internodes of 100 canes of each variety were counted, 25 canes being taken from each of 4 different plats.

P.O.J. 2725 had more sprouted roots and clinging leaf pieces than did either P.O.J. 2878 or Mayaguez 28. Due to their recumbent position, the canes of B.H. 10(12) had a higher proportion of joints with sprouted roots than did the canes of any other variety. There was little difference in the ease of trashing P.O.J. 2878 and Mayaguez 28; both trashed much more freely than did P.O.J. 2725, and somewhat more so than did B.H. 10(12).

Quality of cane.—To determine the relative amounts of pithiness, the cut surfaces of 2,000 harvested cane pieces of each variety were examined (table 13). Pithiness was pronounced for P.O.J. 2725, P.O.J. 2714, and P.O.J. 2878; rather pronounced for Mayaguez 3; slight for Mayaguez nos. 7, 28, 42, and 49; and negligible for S.C. 12/4 and for B.H. 10(12). Hollow centers were found in 5 to 8.5 percent of the canes of the 3 Javan varieties, in only 1 to 2 percent of those of the 5 Mayaguez seedlings, and in 0.5 percent of those of S.C. 12/4. No hollow centers were found in the canes of B.H. 10(12). The canes of P.O.J. 2878 were less solid than those of Mayaguez 28.

Dry top rot.—P.O.J. 2714 suffered badly from dry top rot (*Plasmodiophora*). Most of its cane tops died before harvest, whereas those of the other varieties were practically unaffected. Not only were there nearly twice as many more P.O.J. 2714 cane pieces per 1,000 with dry top rot than were found in any other variety, but also the dry top rot extended over a much greater area, generally occupying over half the area of the cut surface examined (table 13). Practically no difference in the amount of dry top rot of the P.O.J. 2878, Mayaguez 28, and P.O.J. 2725 canes was observed. B.H. 10(12) and Mayaguez 42 had solid canes and were practically free from the disease. The data on dry top rot for the two series of plats were similar.

Borer infestation.—Wolcott [8] states that cane-borer counts taken in plats of carefully controlled small-scale experiments are not dependable. The data presented (table 13), however, are valuable in indicating that none of the varieties are extremely susceptible. As has been observed repeatedly near Central Aguirre, S.C. 12/4 and B.H. 10(12) were found to be comparatively free from borer attack. P.O.J. 2878 was consistently less susceptible than P.O.J. 2725 at Coloso. The higher borer counts of P.O.J. 2725 are probably due to the larger proportion of clinging leaves, which may have harbored insects.

GENERAL FIELD PLANTINGS AT CENTRAL COLOSO AND AT ISABELA

Despite wide spacing that induced the formation of water sprouts and decreased the percentage of sugar in cane, results with P.O.J. 2878 in 1931 at Central Coloso were in general favorable, as shown in table 14.

[8] WOLCOTT, G. C. ON METHODS OF DETERMINING BORER ABUNDANCE IN CANE FIELDS. Internatl. Soc Sugar Cane Technol. Proc. Bul. 88, 2 p., 1932.

TABLE 14.—*Sugar yields of P.O.J. 2878 at Centrals Eureka, Pagan, and Coloso, in 1931*

CENTRAL EUREKA

Hacienda, field number, and culture	Estimated proportion of sugar in cane
	Percent
Flora, field no. 5; 12½-month primavera cut in April	10.77
Garces, field no. 3; 13½-month primavera cut in April	9.72
Acacia, field no. 1; 13½-month primavera cut in May	12.28
Acacia, field no. 12; 12-month primavera cut in May	11.29
Javierre, field no. 1; 14½-month primavera cut in May	11.75
Javierre, field no. 7–A; 13-month primavera cut in February	11.66
Javierre, field no. 7–B; 11½-month primavera cut in May	10.04
Javierre, field no. 8–B; 14½-month primavera cut in April	10.85
Conformidad, field no. 1; 13½-month primavera cut in May	10.85
Conformidad, field no. 5; 13½-month primavera cut in May	10.92
Average	[1] 11.01

CENTRAL PAGAN

Playa, field no. 4–B; 18-month gran cultura cut in February	10.31
Elisa, field no. 11; 17-month gran cultura cut in February	9.79
Altagracia, field no. 19–A; 16-month gran cultura cut in January	10.83
Average	10.31

CENTRAL COLOSO

Casualidad, Rio Viejo, field no. 23; 12½-month gran cultura cut in January	8.83
Santoni,[2] 13- to 17-month gran cultura cut from Nov. 23 to Feb. 4	10.99
Maizal, field no. 26; 16- to 19-month gran cultura cut from Nov. 23 to Apr. 9	11.28
Maizal, field no. 27; 16½- to 20½-month gran cultura cut from Dec. 29 to Apr. 1	10.57
La Salle, field no. 30; 14½-month gran cultura cut from Jan. 13 to Jan. 28	12.29
Milagros, field no. 16; 15-month gran cultura cut in November	11.95
Milagros, field no. 17; 14- to 15-month gran cultura cut in December	12.11
Molino, field no. 20; 12½- to 13-month gran cultura cut in December	10.86
Romana,[2] 8-month ratoon cut in December	9.06
Villanueva, field no. 32; 16½- to 17-month gran cultura cut in December	11.78
Barrero, field no. 33; 16- to 18-month gran cultura cut in December	11.20
Lucas, field no. 52; 15- to 16½-month gran cultura cut in November	11.05
Hospital, field no. 49: 16½-month primavera cut in March	12.00
Hospital, field no. 49; 13- to 14-month ratoons cut in March	11.00
New Corsica;[2] 12-month primavera cut in March	10.41
Average	11.02

[1] Total acreage, 177 acres with an average of 36.9 tons of cane per acre.
[2] Fields at Santoni, Romana, and New Corsica were not numbered.

The sugar in cane was 10 percent or more in 21 fields and was less than 10 percent in only 4 fields. In some instances nearly 12 percent was secured in late November. Omitting from consideration the data for Isabela, which because of different conditions were not strictly comparable with those from Coloso, the results with first ratoons of P.O.J. 2878 were encouraging. One field of ratoons produced 46.77 tons per acre of cane, and another 52.68 tons. In production of sugar, calculated on a monthly pro rata basis, these ratoon fields exceeded 0.4 ton per month. Only 4 gran-cultura fields equaled this cane production and only 2 yielded as much sugar per month.

Data for the 1932 crop at Coloso on the behavior of P.O.J. 2878 in 30 fields totaling 411 acres are shown in tables 15 and 16.

TABLE 15.—*Results of tests of sugarcane varieties at Central Coloso, 1932* [1]

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Acre yield of sugar
		Sucrose	Purity		
	Tons	*Percent*	*Percent*	*Percent*	*Tons*
P.O.J. 2878 (15-month gran cultura cut in February): Field no. 7 (16 acres), second district of Moca, Tablon Vinet; nonirrigated poorly drained [2] lowland; silty clay	29.23	17.14	82.3	13.06	3.82
P.O.J. 2725 (14-month gran cultura cut in January): Field no. 7 (13 acres), second district of Moca, Tablon Vinet; nonirrigated poorly drained lowland; silty clay	55.68	15.30	85.9	11.92	6.63
P.O.J. 2878 (17-month gran cultura cut in December): Field no. 25 (6.56 acres), second district of Moca, Tablon Maizal; irrigated fairly well-drained but flooded lowland; silty clay	52.76	14.01	79.9	10.50	5.54
S.C. 12/4 (13-month gran cultura cut in December): Field no. 25 (10.57 acres), second district of Moca, Tablon Maizal; irrigated fairly well-drained but floodedlowland: silty clay	42.65	14.02	82.8	10.71	4.57
P.O.J. 2878 (17-month gran cultura cut in December): Field no. 32 (12.27 acres), second district of Moca, Tablon Isleta; unirrigated fairly well-drained and not flooded hillside; clay	31.75	17.32	83.6	13.26	4.21
P.O.J. 2725 (16-month gran cultura cut in December): Field no. 32 (12.79 acres), second district of Moca, Tablon Isleta; unirrigated fairly well-drained and not flooded hillside; clay	37.28	16.78	83.0	12.84	4.79
P.O.J. 2878 (14-month ratoons cut in February): Field no. 21 (9.26 acres), first district of Aguada, Tablon Aviles; unirrigated fairly well-drained and not flooded hillside; clay	28.45	14.45	76.7	10.58	3.01
S.C. 12/4 (13-month ratoons cut in January): Field no. 21 (30.07 acres), first district of Aguada, Tablon Aviles; unirrigated fairly well-drained and not flooded hillside; clay	21.22	16.99	87.0	12.69	2.69
P.O.J. 2878 (13-month ratoons cut in January): Field no. 33 (15.15 acres), first district of Aguada, Tablon Villanueva; unirrigated fairly well-drained and not flooded hillside; clay	45.68	14.12	79.4	10.55	4.82
B.H. 10 (12) (12-month ratoons cut in March): Field no. 33 (13.92 acres), first district of Aguada, Tablon Villaneuva; unirrigated fairly well-drained and not flooded hillside; clay	42.03	16.99	85.0	13.16	5.53
P.O.J. 2878 (15-month gran cultura cut in January): Field no. 42 (4.14 acres), third district of Aguada, Cerro Cayures; unirrigated fairly well-drained and not flooded hillside; clay	39.55	13.47	79.5	10.07	3.98
P.O.J. 2725 (16-month gran cultura cut in January): Field no. 42 (10 acres), third district of Aguada, Cerro Cayures; unirrigated fairly well-drained and not flooded hillside; clay	55.41	14.80	83.0	11.32	6.27
P.O.J. 2878 (13-month primavera cut in February): Field no. 44 (19 acres), third district of Aguada, Cerro Cayures; unirrigated fairly well-drained and not flooded hillside; clay	41.95	14.17	79.1	10.56	4.43
B.H. 10 (12) (15-month primavera cut in April): Field no. 44 (17.53 acres), third district of Aguada, Cerro Cayures; unirrigated fairly well-drained and not flooded hillside; clay	27.18	16.25	83.3	12.56	3.38
P.O.J. 2878 (15-month ratoon cut in March): Field no. 12 (20 acres), second district of Aguada, Limon; irrigated poorly drained and not flooded lowland; clay	43.61	14.82	80.6	11.16	4.87
P.O.J. 2725 (14-month ratoon cut in February): Field no. 12 (23.66 acres), second district of Aguada, Limon; irrigated poorly drained and not flooded lowland; clay	42.22	14.48	82.1	11.01	4.65
P.O.J. 2878 (12-month ratoons cut in April): Field no. 22 (5.01 acres), third district of Aguada, Tablon Estacion; unirrigated poorly drained and not flooded lowland; clay	33.67	16.13	80.7	12.16	4.09
B.H. 10 (12) (14-month ratoons cut in May): Field no. 22 (6 acres), third district of Aguada, Tablon Estacion; unirrigated poorly drained and not flooded lowland; clay	32.09	13.81	80.6	10.39	3.33
S.C. 12/4 (15-month ratoons cut in June): Field no. 22 (4 acres), third district of Aguada, Tablon Estacion; unirrigated poorly drained and not flooded lowland; clay	20.14	12.39	80.4	9.32	1.88
P.O.J. 2878 (15-month primavera cut in April): Field no. 26 (2.11 acres), Colonia Casualidad, Aguada, Teniente	25.78	17.46	79.6	13.06	3.37

[1] Field data supplied by Guillermo Cabrera, Central Coloso.
[2] Poorly or fairly well-drained refer to adequacy of ditching for surface and artificial drainage.

TABLE 15.—*Results of tests of sugarcane varieties at Central Coloso, 1932* [1]—Con.

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Acre yield of sugar
		Sucrose	Purity		
	Tons	*Percent*	*Percent*	*Percent*	*Tons*
B.H. 10 (12) (13-month primavera cut in February): Field no. 26 (12 acres), Colonia Casualidad, Aguada, Teniente	26.45	16.91	83.4	12.97	3.43
S.C. 12/4 (14-month primavera cut in March): Field no. 26 (14.3 acres), Colonia Casualidad, Aguada, Teniente	34.75	18.57	86.7	14.53	5.05
P.O.J. 2878 (12-month ratoons cut in December): Field no. 22 (4 acres), Colonia Casualidad, Rio Viejo	26.93	14.42	76.2	10.52	2.83
B.H. 10 (12) (12-month ratoons cut in January): Field no. 22 (19.08 acres), Colonia Casualidad, Rio Viejo	39.83	14.66	81.9	11.14	4.44
P.O.J. 2878 (12-month ratoons cut in November): Field no. 29 (0.9 acre), Colonia Casualidad, Cerro Cardona	67.07	14.23	81.5	10.28	6.89
P.O.J. 2725 (12-month ratoons cut in November): Field no. 29 (15.28 acres), Colonia Casualidad, Cerro Cardona	30.12	15.64	83.2	11.97	3.61
S.C. 12/4 (12-month ratoons cut in December): Field no. 29 (2.5 acres), Colonia Casualidad, Cerro Cardona	31.28	15.11	82.4	11.52	3.60
B.H. 10 (12) (12-month ratoons cut in May): Field no. 29 (1.36 acres), Colonia Casualidad, Cerro Cardona	45.18	16.61	85.7	12.92	5.84
P.O.J. 2878 (14-month ratoons cut in February): Field no. 21 (31.8 acres), Aviles; unirrigated fairly well-drained hillside undulating to lowland; clay	34.68	14.50	78.7	10.78	3.74
P.O.J. 2878 (12-month ratoons cut in December): Field no. 32 (16.16 acres), Villanueva; unirrigated fairly well-drained hillside undulating to lowland; clay	40.59	13.96	79.1	10.40	4.22
P.O.J. 2878 (12-month ratoons cut in April): Field no. 49 (24.14 acres), Hospital; irrigated fairly well-drained and flooded lowland; silty clay	37.86	15.46	80.7	11.65	4.41
P.O.J. 2878 (13-month ratoon cut in February): Field no. 50 (22.74 acres), Barrera; irrigated fairly well-drained and not flooded lowland; silty clay	45.21	14.47	77.5	10.66	4.82
P.O.J. 2878 (14-month ratoons cut in January): Field no. 52 (13.44 acres), Lucas; irrigated fairly well-drained and not flooded lowland; silty clay	45.98	13.02	77.8	9.61	4.42
P.O.J. 2878 (15-month gran cultura cut in November): Field no. 1 (15.71 acres), Sabana; unirrigated poorly drained hillside; clay	44.00	15.88	84.0	12.23	5.38
P.O.J. 2878 (15-month gran cultura cut in November): Field no. 2 (16.42 acres), Sabana; unirrigated poorly drained hillside; clay	37.01	15.19	82.3	11.57	4.28
P.O.J 2878 (13-month ratoons cut in January): Field no. 16 (35.66 acres); Milagros; unirrigated fairly well-drained and flooded lowland; clay	48.22	14.80	80.0	11.10	5.35
P.O.J. 2878 (10-month ratoons cut in January): Field no. 17 (17.65 acres), Milagros; unirrigated poorly drained and flooded lowland; clay	43.07	14.61	80.9	11.03	4.75
P.O.J. 2878 (15-month ratoons cut in April): Field no. 20 (12.62 acres), Molina; irrigated poorly drained and flooded lowland; silty clay	39.65	15.45	80.1	11.60	4.60

TABLE 16.—*Results of sugarcane variety tests on irrigated, friable, well-drained clay at Central Coloso, Irurena farm, Isabela district, 1931–32* [1]

Variety, culture, and size of field	Acre yield of cane	Normal juice analyses		Sugar in cane	Acre yield of sugar
		Sucrose	Purity		
	Tons	*Percent*	*Percent*	*Percent*	*Tons*
P.O.J. 2878 (20-month gran cultura cut in February and March): Field no. 23 (7.81 acres), irrigated undulating field [2]	34.88	14.59	78.3	10.81	3.77
P.O.J. 2714 (20-month gran cultura cut in March): Field no. 23 (1 acre)	44.00	14.50	76.9	10.61	4.67
P.O.J. 2878 (11-month ratoons cut in March): Field no. 5 (23.42 acres)	22.67	15.36	81.8	11.62	2.64
S.C. 12/4 (12-month ratoons cut in April): Field no. 5 (1.81 acres)	18.19	15.86	84.5	12.25	2.23
P.O.J. 2878 (12-month ratoons cut in May): Field no. 6 (6.23 acres)	19.82	15.49	82.2	11.79	2.34
S.C. 12/4 (13-month ratoons cut in March): Field no. 6 (20.09 acres)	20.22	15.94	85.9	12.41	2.51

[1] Data supplied by Guillermo Cabrera, Central Coloso.

[2] None of these lands is subject to flooding, and all drain well. All fields were undulated friable red-brown clay with a very porous subsoil.

TABLE 16.—*Results of sugarcane variety tests on irrigated, friable, well-drained clay at Central Coloso, Irurena farm, Isabela district, 1931–32*—Continued

Variety, culture, and size of field	Acre yield of cane	Normal juice analyses		Sugar in cane	Acre yield of sugar
		Sucrose	Purity		
	Tons	*Per-cent*	*Per-cent*	*Per-cent*	*Tons*
P.O.J. 2714 (11-month ratoons cut in April): Field no. 6 (0.75 acre)	29.70	15.47	81.1	11.69	3.47
P.O.J. 2878 (14-month ratoons cut in April): Field no. 17 (10.11 acres)	33.65	15.97	83.2	12.23	4.12
S.C. 12/4 (14-month ratoons cut in April): Field no. 17 (9.06 acres)	25.59	16.95	85.6	13.18	3.37
P.O.J. 2725 (12-month ratoons cut in February): Field no. 17 (2.92 acres)	26.93	17.07	85.1	13.23	3.56
P.O.J. 2878 (13½-month gran cultura cut in January): Field no. 11 (13.54 acres)	42.97	13.16	77.2	9.67	4.15
P.O.J. 2878 (14½-month gran cultura cut in February): Field no. 12 (24.72 acres)	42.10	13.97	79.7	11.18	4.71
P.O.J. 2878 (20-month gran cultura cut in February): Field no. 22 (2.73 acres)	11.46	14.33	80.9	10.81	1.24
P.O.J. 2878 (21-month gran cultura cut in March to June): Field no. 24 (4.87 acres)	31.65	15.54	82.0	11.81	3.74

On account of differences in harvest dates the juice qualities of the different varieties are not always comparable. The most striking feature is the generally superior percentage of sugar in cane of P.O.J. 2878 at Coloso over that of the same variety at Centrals Carmen, Constancia, and Plazuela, owing apparently to better drainage, less rainfall during the ripening period, and the more suitable soil types. A large proportion of the Coloso P.O.J. 2878 cane in 1932 was grown on fairly well-drained undulating hillsides of clay soil. Furthermore, the lowlands also were largely made up of a fairly stiff soil and were not subjected to overflow for protracted periods as were those along the north coast. In 1932 at Coloso the sugar in cane of P.O.J. 2878 fell below 10 percent in only two fields, whereas this value was seldom attained along the north coast.

On the uplands of Central Coloso near Moca the percentage of sugar in cane of P.O.J. 2878 was superior to that of P.O.J. 2725. In general, however, P.O.J. 2878 was inferior in this respect to both S.C. 12/4 and B.H. 10(12). This was due in part to an earlier harvest, but P.O.J. 2878 must be harvested early because otherwise the next crop makes a stunted growth, due to arrowing. The sugar production per month was lower for gran cultura than for primavera or first ratoons of P.O.J. 2878. Where irrigation water is available and early spring planting can be practiced this is apparently more desirable than fall planting, particularly at Isabela where gran-cultura canes dry out badly at the top. Fields of P.O.J. 2878 gran cultura produced from 0.188 to 0.265 ton of sugar per month at Isabela and from 0.211 to 0.359 ton at Moca, Aguadilla, and Aguada. The ratoons and primavera produced from 0.195 to 0.36 ton of sugar per month at Isabela and 0.307 to 0.48 ton elsewhere. Presumably the primavera and first ratoons combined would be more profitable than the single gran cultura. The latter would occupy the land almost as long as the two short-time crops if the resting period between the spring harvest and fall planting is charged to the gran cultura. Complications that arise in trying to adapt such a scheme to the customary harvesting period make it impracticable to discontinue gran-cultura plantings altogether; it appears, however, that in the Isabela area there would be some advantage in increasing the area devoted to primavera plantings.

The high cane production obtainable in ratoons of P.O.J. 2878 at Coloso is illustrated in figure 4. This 22-acre field of 14-month-old ratoons gave an average yield in 1931 of 47 tons of cane per acre, a very high production for ratoons in this district. Note the erect growth and sparse arrowing, both of which characters give P.O.J. 2878 marked advantages over P.O.J. 2725.

Varietal adaptability at Isabela.—At Isabela the subsoil is so porous that water filters rapidly from the surface. This fact and the drying effect of an almost continuous wind render irrigation water inadequate during periods of low rainfall. S.C. 12/4 and other susceptible varieties become heavily infected with mosaic and must be rogued out, thus increasing planting costs. Hence, drought and mosaic are

FIGURE 4.—P.O.J. 2878 made splendid growth in a long first-ratoon crop at Coloso. Photographed December 19, 1930.

the chief limiting factors for cane at Isabela. A prolific, drought-resistant variety that will cover the ground rapidly and resist mosaic is needed. Very late and sparse arrowing is another desirable character.

B.H. 10(12) is not suited to the Isabela district and almost invariably fails there. The early arrowing habit of P.O.J. 2725 is objectionable; ratoons of this variety will arrow profusely at Isabela when the canes are not more than 1.2 to 1.5 meters (4 to 5 feet) tall. Even late harvest in May will not prevent arrowing in ratoons. The only varieties that have met with any favor are the mosaic-resistant, late-arrowing, P.O.J. 2878, and the mosaic-susceptible, sparse-arrowing, S.C. 12/4. No variety trials are available to demonstrate the relative sugar productions of these two varieties. Cane growers plant one or the other of them depending on whether heavy replanting costs in the first ratoons of S.C. 12/4 are more of a drawback than is the somewhat lower percentage of sugar in cane of P.O.J. 2878. Neither of these varieties is considered satisfactory. The difficulty

experienced in Isabela is, however, not entirely one of varieties, but is partly that of a rational application of water in a newly opened irrigation district.

GRAN-CULTURA TRIALS AT CENTRAL PAGAN

B.H. 10(12) is the major cane variety on the Central Pagan properties of Russell & Co. Considerable of the soils there have a good granular structure and are well adapted to that variety. Mosaic spreads very rapidly there and owing to the expense of roguing the susceptible B.H. 10(12), a mosaic-resistant cane is badly needed. Some P.O.J. 2725 has been grown, but is unsatisfactory because of its objectionable habit of early arrowing. Reports are available on general field results in 1931-32 and on three variety trials in which P.O.J. 2878 was planted in checkerboard fashion with B.H. 10(12). In every trial there were four ⅛-acre plats planted to each variety. The plats of B.H. 10(12) were rogued for mosaic, but roguing is generally practiced here and is therefore a general handicap for susceptible varieties. In calculating the significance of the data at Central Pagan each plat of P.O.J. 2878 was paired with the two nearest plats of B.H. 10(12). To secure the sucrose analyses the canes from plats of the same variety were ground together. The large mill units make the grinding of small lots impracticable.

On all fields of the 1932 season a 12–8–4 fertilizer at the rate of 400 pounds per acre was applied to the crop when it was 1½ months old, and ammonium sulphate at the rate of 375 pounds per acre 2½ months later. Applications made in 1931 were essentially the same.

The gran-cultura trials at field no. 1, Hacienda Trinidad, of Central Pagan were conducted on a friable silt loam. There was ample water throughout the crop period (table 3). The field was flooded over when the cane was 10 months old. The crop was harvested in January 1931, when 17 months old. The results are shown in table 17.

TABLE 17.—*Results of gran-cultura sugarcane variety tests on unirrigated silt loam at Central Pagan, Hacienda Trinidad (field no. G1) 1931* [1]

Variety and plat	Acre yield of cane	Normal juice analyses		Available 96° sugar per acre
		Sucrose	Purity	
	Tons	*Percent*	*Percent*	*Tons*
B.H. 10(12); plat 1	51.2			
P.O.J. 2878; plat 2	43.6			
B.H. 10(12); plat 3	58.8			
P.O.J. 2878; plat 4	48.8			
B.H. 10(12); plat 5	51.6			
P.O.J. 2878; plat 6	50.4			
B.H. 10(12); plat 7	53.2			
P.O.J. 2878; plat 8	43.6			
P.O.J. 2878 (average) [2]	46.6±2.25	15.0	82.4	[3] 6.97
B.H. 10(12) (average) [2]	53.7±2.05	16.9	86.9	[3] 8.25

[1] The data were supplied by E. H. Barrow, Russell & Co.
[2] Averages of 4 plats ⅛ acre in size, cut in January when 17 months old.
[3] To secure the sugar tonnage the 4 plats of each variety were ground together.

The B.H. 10(12) plats exceeded adjoining plats of P.O.J. 2878 by a margin of 8 or 10 tons of cane per acre in three comparisons. The average cane production was 53.7 tons per acre for B.H. 10(12) and 46.6 tons for P.O.J. 2878; the odds are 49 to 1 that this difference is significant. Owing to a definitely lower sucrose and purity for P.O.J.

2878, the sugar productions were even more contrasting, 8.25 tons per acre for B.H. 10(12) and 6.97 tons for P.O.J. 2878.

In the first ratoons of the above plantings, P.O.J. 2878 outyielded B.H. 10(12) by a margin of 6.4 tons of cane per acre. The crop was not irrigated and was cut in June 1932, when it was 18¼ months old. The results are shown in table 18.

TABLE 18.—*Results of first-ratoon sugarcane variety tests on unirrigated silt loam at Central Pagan, Hacienda Trinidad (field no. G1), 1932*

Variety and plat	Acre yield of cane	Normal juice analyses			Available 96° sugar per acre
		Brix	Sucrose	Purity	
	Tons		*Percent*	*Percent*	*Tons*
B.H. 10(12); plat 1	35.20				4.020
P.O.J. 2878; plat 2	37.20				3.924
B.H. 10(12); plat 3	36.00				4.112
P.O.J. 2878; plat 4	44.00				4.641
B.H. 10(12); plat 5	34.40				3.929
P.O.J. 2878; plat 6	34.00				3.586
B.H. 10(12); plat 7	32.00				3.655
P.O.J. 2878; plat 8	47.20				4.979
B.H. 10(12) (average of plats 1, 3, 5, 7)[1]	34.20	17.8	14.8	83.4	3.929
P.O.J. 2878 (average of plats 2, 4, 6, 8)[1]	40.60	17.5	14.0	79.8	4.283

[1] Averages of four ⅛-acre plats cut in June when 18¼ months old.

Productions were very variable, however, and the odds low, only 13 to 1, indicating no significant differences between the two varieties in ratoons. Such advantage as P.O.J. 2878 had in cane tonnage was almost entirely offset by the higher percentage purity of B.H. 10(12), so that differences in sugar production were slight. Rainfall was very heavy during the 2 months preceding harvest (table 3). Apparently, with heavy rainfall and on friable, alluvial soil subject to overflow, B.H. 10(12) ripens better than does P.O.J. 2878. The total sugar production per acre for the gran cultura and first ratoons was 12.179 tons for B.H. 10(12) and 11.253 tons for P.O.J. 2878. Soils of this type should be avoided when cropping P.O.J. 2878 in the Anasco Valley.

Central Pagan gran-cultura variety trial at Hacienda Altagracia, 1932.—In the Hacienda Altagracia variety trial on silty clay loam not subject to overflow, P.O.J. 2878 exceeded the cane production of B.H. 10(12) by the definite margin of 6 to 7 tons per acre in three plats. The results are shown in table 19.

TABLE 19.—*Results of gran-cultura sugarcane variety tests on silty clay loam at Central Pagan (field Dolores A–26), 1932* [1]

Variety and plat	Acre yield of cane	Normal juice analyses		Available 96° sugar per acre [2]
		Sucrose	Purity	
	Tons	*Percent*	*Percent*	*Tons*
B.H. 10(12); plat 1	58.4			
P.O.J. 2878; plat 2	64.0			
B.H. 10(12); plat 3	55.2			
P.O.J. 2878; plat 4	58.8			
B.H. 10(12); plat 5	53.6			
P.O.J. 2878; plat 6	60.0			
B.H. 10(12); plat 7	56.0			
P.O.J. 2878; plat 8	62.0			
P.O.J. 2878 (average of plats 2, 4, 6, 8)[3]	61.2±1.8	13.5	80.5	6.272
B.H. 10(12) (average of plats 1, 3, 5, 7)[3]	55.8±1.4	13.7	83.4	5.915

[1] The data were supplied by Waldemar Riff, of Russell & Co.

[2] The sugar production data is based on an extraction of 80.7 percent and a boiler house efficiency of 100 percent. Mean increase in favor of P.O.J. = 5.4 tons of cane per acre.

[3] Averages of 4 plats, ⅛ acre in size, cut in December when 17⅓ months old.

The difference in favor of P.O.J. 2878 is statistically significant, the odds being 728 to 1 that the difference in cane production was not due to chance. Owing to both a low sucrose and a lower purity, P.O.J. 2878 led B.H. 10(12) in sugar production by only 0.357 ton per acre. The soil was of a heavier type than that of the 1931 gran-cultura trial at Hacienda Trinidad, where B.H. 10(12) was definitely superior to P.O.J. 2878 in sugar production. P.O.J. 2878 had the advantage of being planted in pieces about 1 meter long. B.H. 10(12) was planted in short three-bud cuttings, one every 30 centimeters in the row, to prevent mosaic from spreading too rapidly. Since B.H. 10(12) is susceptible to mosaic, infection from one joint of a long cane is likely to spread throughout its length.

Central Pagan gran-cultura variety trial at Hacienda Esperanza.—The data of a duplicate gran-cultura variety trial in which P.O.J. 2878 was compared with B.H. 10(12) were gathered at Hacienda Esperanza of Central Pagan on irrigated clay. The crop was harvested in December 1931, when it was 19⅓ months old. The results are shown in table 20.

TABLE 20.—*Results of gran-cultura sugarcane variety tests on irrigated clay at Central Pagan (field Pagan E–3), 1931* [1]

Variety and plat	Acre yield of cane	Normal analyses of juice			Available 96° sugar per acre
		Brix	Sucrose	Purity	
	Tons		*Percent*	*Percent*	*Tons*
B.H. 10(12); plat 1	55.60				5.617
P.O.J. 2878; plat 2	66.40				6.588
B.H. 10(12); plat 3	58.80				5.941
P.O.J. 2878; plat 4	57.20				5.851
B.H. 10(12); plat 5	57.20				5.780
PO.J. 2878; plat 6	61.60				6.301
B.H. 10(12); plat 7	61.60				6.224
P.O.J. 2878; plat 8	60.00				6.138
B.H. 10(12) (average of plats 1, 3, 5, and 7) [2]	58.30	15.8	13.1	83.3	5.891
P.O.J. 2878 (average of plats 2, 4, 6, and 8) [2]	60.80	16.8	13.5	80.6	6.219

[1] These plantings and those at Altagracia were made and harvested through the cooperation of Waldemar Riff, of Russell & Co., Central Pagan.

[2] Averages of four ⅛-acre plats cut in December when 19⅓ months old.

P.O.J. 2878 is well adapted to the stiff soils of the Anasco Valley and grew very rapidly, especially at first, as illustrated in figure 5. Fifty canes of P.O.J. 2878 averaged 2.03 meters to the highest leaf triangle, whereas a like number of B.H. 10(12) canes averaged only 1.9 meters. There was considerable variability, however, in cane production. P.O.J. 2878 outyielded B.H. 10(12) in only two plats, and the two varieties showed no significant differences.

The canes in both trials of the 1932 crop season were 19⅓ months old at harvest. In each case planting was done May 20 and the harvest was completed in late December. Rotting of a considerable part of the cane at Hacienda Esperanza rendered cane tonnage data somewhat unreliable. May planting is apparently too early for best results in gran-cultura trials with P.O.J. 2878 at Anasco.

Early gran cultura in the Anasco Valley on irrigated lowland showed no marked advantage of P.O.J. 2878 over B.H. 10(12) in cane production, and the sucrose content of B.H. 10(12) was the more dependable. The early growth made by P.O.J. 2878 (fig. 5) was superior

to that of B.H. 10(12), but the final results in harvested cane did not offer any sharp contrast. The purity percentage of P.O.J. 2878 was inferior to that of B.H. 10(12) to a lesser extent in the two variety trials on fairly compact soils in 1932 than on the friable soil of the 1931 variety trial.

GENERAL FIELD PLANTINGS AT CENTRAL PAGAN

The general field results with approximately 50 acres of P.O.J. 2878 gran cultura at Central Pagan in the 1931 crop were not considered

FIGURE 5.—P.O.J. 2878 makes a rapid early growth in the Anasco Valley gran-cultura plantings. P.O.J. 2878, on the left, is taller than B.H. 10(12), on the right, 7 months old, at Hacienda Esperanza, Central Pagan. Photographed December 20, 1930.

to be satisfactory (table 14). The sugar in cane was, as a rule, either below or barely above 10 percent. In many instances the top portions of much of the cane had to be discarded to secure cane ripe enough for acceptance at the mill.

The general field results of the 1932 crop with P.O.J. 2878 at Central Pagan are given in table 21.

TABLE 21.—*Results of sugarcane variety tests conducted by Russell & Co. at Central Pagan, Anasco, 1932* [1]

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (18-month gran cultura cut in December): Field E-8 (15 acres), Hacienda Pagan,[2] irrigated undulated land	*Tons* 57.04	*Percent* 14.18	*Percent* 80.17	*Percent* 11.17	*Tons* 6.371
P.O.J. 2725 (15-month gran cultura cut in January): Field U-3 (18.75 acres), Hacienda Librada, unirrigated undulated land	43.82	13.49	83.67	10.35	4.540
P.O.J. 2725 (15-month gran cultura cut in January): Field U-4 (19.8 acres), Hacienda Librada, unirrigated undulated land	47.81	12.37	78.91	9.21	4.403
P.O.J. 2878 (16-month gran cultura cut in February): Field T-15 (21.5 acres), Hacienda Trinidad, unirrigated undulated land	39.47	14.91	80.67	11.29	4.456

[1] These data were supplied by E. H. Barrow, of Russell & Co.
[2] Because the soil survey is not completed the data on soil types are omitted.

TABLE 21.—*Results of sugarcane variety tests conducted by Russell & Co. at Central Pagan, Anasco, 1932*—Continued

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
	Tons	*Percent*	*Percent*	*Percent*	*Tons*
P.O.J. 2878 (17-month gran cultura cut in April): Field T–16 (21.75 acres), Hacienda Trinidad, unirrigated undulated land	34.68	15.85	81.86	12.07	4.185
P.O.J. 2878 (17-month gran cultura cut in April): Field T–17 (18.3 acres), Hacienda Trinidad, unirrigated undulated land	32.24	15.45	79.94	11.61	3.743
P.O.J. 2878 (13-month primavera cut in February): Field E–11 (15.5 acres), Hacienda Trinidad, irrigated undulated land	37.97	15.77	80.21	11.86	4.503
B.H. 10(12) (13-month primavera cut in March): Field E–7 (11.9 acres), Hacienda Trinidad, irrigated undulated land	25.95	17.38	85.36	13.50	3.503
P.O.J. 2878 (17-month gran cultura cut in February): Field P–3 (27.3 acres), Hacienda Trinidad, irrigated lowland	67.27	12.14	75.81	8.85	5.953
B.H. 10(12) (17-month gran cultura cut in February): Field P–2 (12.9 acres), Hacienda Trinidad, irrigated lowland	76.39	13.06	79.48	9.76	7.455
P.O.J. 2878 (16-month primavera cut in March): Field G–4 (30 acres), Hacienda Trinidad, irrigated undulated land	43.95	14.90	80.68	11.29	4.961
P.O.J. 2878 (16-month primavera cut in May): Field P–5 (12 acres), Hacienda Trinidad, irrigated undulated land	48.67	14.85	82.66	11.36	5.528
P.O.J. 2878 (18-month gran cultura cut in December): Field A–26 (11.25 acres), Hacienda Dolores, irrigated undulated land	49.56	13.42	80.02	10.11	5.010

As shown in table 21, the purity of gran-cultura P.O.J. 2878 in no instance exceeded 82 percent. In the only primavera fields directly comparable in age and time of harvest, fields E–11 and E–7 at Hacienda Trinidad, the sugar in cane of B.H. 10(12) was 13.5 percent, and that of P.O.J. 2878 only 11.86 percent. P.O.J. 2878 more than offset this, however, by its markedly superior cane production, averaging 37.97 tons per acre, or 12 tons more than did B.H. 10(12).

A preliminary variety trial on two ⅛-acre plats of high land per variety at Hacienda Trinidad of Central Pagan was harvested February 8 to 9, 1932, when 18 months old. P.O.J. 2878 yielded at the acre rate of 59.2 tons of cane, or 0.8 ton less than did P.O.J. 2725. In sugar production per acre, however, there was a marked difference, 7.077 tons for P.O.J. 2878, and 5.612 tons for P.O.J. 2725. Throughout the island, P.O.J. 2878 has given a higher percentage of sugar in cane than has P.O.J. 2725 in variety trials, as well as in the less reliable comparisons based on miscellaneous data on adjoining fields. These favorable results indicate that more extensive variety trials with P.O.J. 2878 should be made on upland soils in the Anasco Valley.

GRAN-CULTURA TRIAL AT FILIAL AMOR

In the variety trial conducted on silty clay by the Insular Department of Agriculture in cooperation with Russell & Co., P.O.J. 2725 was used as the control and grown on 15 plats systematically distributed. A 12–8–4 fertilizer, at the rate of 400 pounds per acre, was applied to the crop in September 1930, and ammonium sulphate, at the rate of 350 pounds per acre, in December 1930. Irrigation water was applied but not measured in January, February, and March 1931. The results are shown in table 22.

TABLE 22.—*Results of gran-cultura sugarcane variety tests conducted on irrigated silty clay by the Insular Department of Agriculture in cooperation with Russell & Co. at the San Francisco farm at Filial Amor, 1932* [1]

Variety [2]	Germination	Average [3] acre yield of cane	Average acre yield of sugar	Sugar in cane
	Percent	*Tons*	*Tons*	*Percent*
P.O.J. 2878	97.0	79.33±2.583	10.075±0.328	12.64
P.R. 801	98.0	74.41±2.210	8.729± .259	11.74
P.R. 809	95.6	76.82±2.289	8.831± .250	11.49
P.O.J. 2725 [4]	94.0	76.31±1.375	8.329± .150	10.81
P.O.J. 2714	93.5	69.22±2.390	7.987± .276	11.54
P.R. 803	97.0	69.75±2.135	7.791± .238	11.16
F.C. 916	95.0	67.63± .932	7.595± .105	11.23
P.R. 807	93.6	57.20±1.702	5.943± .177	10.39

[1] These data supplied by P. Richardson Kuntz, of the Insular Experiment Station, Rio Piedras, in advance of their publication.

[2] Irrigation water was applied but not measured on Jan. 22, Feb. 21, and Mar. 15, 1931. The rainfall was 3.75 inches during the 2 months preceding harvest. The cane was harvested in January when 17½ months old.

[3] Averages of six ½₀-acre plats excepting data of P.O.J. 2725 which are averages of 14 plats.

[4] P.O.J. 2725 was grown as a check variety in every fourth plat.

The germination was excellent for all varieties and no replanting was necessary. All varieties grew well from the start. Rainfall was ample throughout the crop period, except from January to March 1931, when it was supplemented by irrigation water; growth was therefore uninterrupted. Conditions were also normal for ripening as only 1.15 inches of rain fell during the month of harvest and only 2.65 inches during the preceding month.

Conditions were much more favorable for high tonnage production at Filial Amor than at Coloso. The total rainfall at Filial Amor (table 3) was 140.36 inches, or about 30 inches greater, and the cane was more closely spaced in the row, one cutting being planted every 30 centimeters instead of three cuttings every meter apart. P.R. 801 and P.O.J. 2714, which were failures at Coloso, produced at Filial Amor, respectively, 74.4 and 69.2 tons of cane per acre. P.O.J. 2878 ranked first in cane production, with an average yield of 79.33 tons per acre, or nearly 30 tons more than at Coloso.

The comparison between P.O.J. 2878 and P.O.J. 2725 is of particular interest as, prior to the introduction of P.O.J. 2878, the latter was the standard variety in the San German Valley. As at Coloso, differences in cane production between these two canes was slight, a margin of 3 tons per acre in favor of P.O.J. 2878. The outstanding result of this trial was, however, the superior juice quality of P.O.J. 2878, which gave it a lead over P.O.J. 2725, P.O.J. 2714, F.C. 916, and the four Puerto Rico seedlings. It exceeded all other varieties by over a ton of sugar per acre. On the rather compact silty clay loam soils of the San German Valley similar to that on which the experiment was conducted, P.O.J. 2878 will probably outyield P.O.J. 2725, P.O.J. 2714, F.C. 916, P.R. 801, P.R. 803, P.R. 807, and P.R. 809 in irrigated gran-cultura plantings.

GENERAL FIELD PLANTINGS IN THE SAN GERMAN VALLEY

The 1931 crop of P.O.J. 2878 in the San German Valley was, contrary to results along the north coast, satisfactory in sugar yield and in cane production. Central Eureka, on cane lands largely of a clay type, secured very satisfactory sugar yields from 177 acres of P.O.J. 2878 primavera (table 14).

Data from the lands of Russell & Co. are available on cane production only. In 2 fields P.O.J. 2878 was markedly the superior and

outyielded B.H. 10(12) by over 10 tons of cane per acre. In the third field B.H. 10(12) gave the somewhat higher production. The average production of 13 fields of P.O.J. 2878, totaling 110.1 acres of gran cultura and distributed over eight different farms, was 62.1 tons of cane per acre. This production compared well with that of 11 fields, totaling 30.4 acres, of P.O.J. 2725, which averaged 62.8 tons of cane per acre, and with that of 12 fields of B.H. 10(12), totaling 174 acres, which averaged 62.8 tons per acre.

P.O.J. 2725, as these data show, also gave good tonnage in this district in 1931, but the purity was low. On several occasions cars of the cane had to be unloaded and the canes sorted out, the rotten or immature canes being discarded, to secure satisfactory sugar yields.

FIGURE 6.—Gran-cultura sugarcane varieties P.O.J. 2878 on the left and B.H. 10(12) on the right, 15 months old, at Central Eureka, in the San German Valley. Photographed December 10, 1930.

This trouble was not experienced with P.O.J. 2878. Even assuming an equal production for the two varieties, P.O.J. 2878 had several advantages over P.O.J. 2725 which gave it the preference. On account of its erect habit of growth, which is general in the area under discussion, very little of the cane rots even in gran cultura where tonnage is heavy. P.O.J. 2725 is reclining in growth habit, and much of the cane rots from contact with the ground. P.O.J. 2878 can be easily harvested because in addition to erect growth it sheds its leaves freely and the hairy leaf sheaths are comparatively unobjectionable. The canes of P.O.J. 2725, on the contrary, tangle when they lodge and the hairy leaf sheaths are made objectionable by the greater number of clinging leaves near the tops. B.H. 10(12) gave a slightly higher tonnage than did P.O.J. 2878 in the general average of the 1931 crop, due largely to a difference in soils. The very best fields—the more fertile alluvial soils—had been reserved for B.H. 10(12), whereas P.O.J. 2878 was grown on more compact clay loam soils on which formerly only Uba cane was thought could be grown. This fortunate

choice of soils for P.O.J. 2878 helps to explain its satisfactory sugar yields in this district.

The marked adaptability of P.O.J. 2878 for the clay lands of the San German Valley is illustrated in figure 6. P.O.J. 2878 arrowed sparingly, and its growth was never seriously interrupted thereby. P.O.J. 2878 grew taller and stooled better than did B.H. 10(12) at Central Eureka. The two rows of P.O.J. 2878 averaged 3.8 meters tall (average of 25 canes), and 340 canes per 31 meters of row. The two rows of B.H. 10(12) averaged 3.48 meters tall, and only 232 canes per 31 meters of row. P.O.J. 2878 had an advantage of 46.7 percent more cane per given length of row.

Data on general field plantings for the 1932 crop of Russell & Co. in the San German Valley are given in table 23.

TABLE 23.—*Results of sugarcane variety tests by Russell & Co. in the San German Valley district* [1]

Variety, culture, size of field, and character of soil	Acre yield of cane	Normal juice analyses		Sugar in cane
		Sucrose	Purity	
	Tons	*Per-cent*	*Per-cent*	*Per-cent*
B.H. 10(12) (11½-month first ratoons cut in December): Field no. 5 (2.2 acres), Hacienda San Francisco, irrigated clay loam	30.49	14.9	83.21	11.41
P.O.J. 2878 (11½-month first ratoons cut in December): Field no. 5 (6 acres), Hacienda San Francisco, irrigated clay loam	34.59	16.1	85.6	12.50
P.O.J. 2878 (12½-month first ratoons cut in January): Field no. 5 (1.63 acres), Hacienda San Francisco, irrigated clay loam	37.92	14.2	78.6	10.53
B.H. 10(12) (12½-month first ratoons cut in January): Field no. 5 (7.32 acres), Hacienda San Francisco, irrigated clay loam	29.29	13.9	79.8	10.40
P.O.J. 2878 (18⅓-month gran cultura cut in January): Field no. 2 (6.55 acres), Hacienda Margarita, unirrigated clay loam	46.85	15.8	84.0	12.18
B.H. 10(12) (18½-month gran cultura cut in January): Field no. 2 (5.2 acres), Hacienda Margarita, unirrigated clay loam [2]	36.39	14.1	82.4	10.73
P.O.J. 2878 (15½- to 16-month gran cultura cut in December): Field no. 2 (18 acres), Hacienda Castro, unirrigated clay loam	73.32	14.5	81.7	11.00
P.O.J. 2878 (16-month gran cultura cut in December): Field no. 2 (7 acres), Hacienda Castro, unirrigated clay loam	69.13	14.9	82.3	11.34
P.O.J 2725 (16- to 16½-month gran cultura cut in December and January): Field no. 2 (10 acres), Hacienda Castro, unirrigated clay loam	56.71	15.5	84.7	11.98
P.O.J. 2878 (17-month gran cultura cut in January): Field no. 5 (15 acres), Hacienda Filial Amor, unirrigated	63.95	15.3	83.0	11.70
P.O.J. 2725 (16- to 17½-month gran cultura cut in December to February): Field no. 5 (34.5 acres), Hacienda Filial Amor, unirrigated	56.41	13.7	80.7	10.31
P.O.J. 2725 (17-month gran cultura cut in January): Field no. 304 (3 acres), Hacienda Constancia, unirrigated, very good, fairly loose alluvial soil [3]	76.37	14.6	88.0	11.49
P.O.J. 2725 (17-month gran cultura cut in January): Field no. 301 (10.5 acres), Hacienda Constancia, partly irrigated, very good, fairly loose alluvial soil [3]	64.69	15.3	87.4	12.01
P.O.J. 2878 (16½-month gran cultura cut in January): Field no. 304 (4 acres), Hacienda Constancia, unirrigated	88.19	14.6	83.5	11.20
P.O.J. 2878 (16- to 17-month gran cultura cut in December and January): Field no. 302 (25 acres), Hacienda Constancia, partly irrigated	63.64	14.6	82.6	11.13

[1] These data were supplied by Owen Proverbs, district superintendent of cultivation.
[2] More rotten canes than in P.O.J. field.
[3] Soils so designated by the field superintendent.

The sugar in cane of P.O.J. 2878 was invariably satisfactory, ranging from 10.5 to 12.5 percent; it seldom dropped below 11 percent, and compared well with that of B.H. 10(12) in adjoining fields. The superior sugar and cane productions of P.O.J. 2878 corroborate those in the cane-variety trial at Filial Amor. Much of the P.O.J. 2878 area was harvested late in December and early in January, and good sugar yields were not therefore owing to delayed harvest, and to favorable ripening conditions, such as prevailed during the months preceding harvest of the cane in the variety trial at Coloso.

The sugar yield of P.O.J. 2878 was generally satisfactory in this district where much of the crop was grown on clay or silty clay soils. On January 6, 1932, gran cultura of P.O.J. 2878, P.O.J. 2725, B.H. 10(12), Mayaguez 7, and Mayaguez 42 were harvested on single ½-acre plats on a farm adjoining that of the variety trial at Filial Amor. P.O.J. 2878 yielded 2 tons more sugar per acre than did the other varieties. P.O.J. 2878 was superior to the other varieties not only in cane production but also in the quality of its juice. With a sugar in cane of 13.23 percent it was sweeter than Mayaguez 7, which gave 11.98 percent, and B.H. 10(12), which gave only 11 percent.

The 1932 gran-cultura crop of P.O.J. 2878 in the San German Valley district of Russell & Co. totaled 248 acres distributed over 7 different farms in 18 fields. The average cane production was 63.2 tons per acre. P.O.J. 2725 averaged 62.2 tons per acre on 87.1 acres, and B.H. 10(12), although grown for the most part on richer soils, averaged only 46.3 tons per acre on 53 acres.

General field data on first ratoons in the San German Valley indicated a marked superiority for P.O.J. 2878 over B.H. 10(12). The former averaged a yield of 46.9 tons per acre of cane on 20.48 acres, whereas the latter averaged a yield of only 32 tons per acre on 31.42 acres.

On friable alluvial soils.—The consistently inferior juices of P.O.J. 2878, on friable alluvial soils subject to overflow was illustrated on the lands of Alfredo Ramirez. On silt loam at Colonia Davila, 17-month-old gran cultura cut January 10, 1932, 0.9 acre of Mayaguez 28 yielded at the acre rate of 56.1 tons, with 14.4 percent of sucrose and 84.6 percent purity, in comparison with 1 acre of P.O.J. 2878, which yielded 59.2 tons of cane with 12 percent of sucrose and 77.2 percent purity. Results from primavera on friable alluvial silt loam[9] next to the river, on the farm of Francisco Murati, of San German, were almost equally discouraging for P.O.J. 2878. One half acre of Mayaguez 42 yielded at the acre rate of 46 tons with a sucrose content of 16.5 percent and a purity of 85 percent. P.O.J. 2878 averaged the same cane tonnage on 7.16 acres, but with a sucrose of 15 percent and a purity of only 79 percent. A considerable part of the P.O.J. 2878 had been laid flat by a windstorm of moderate intensity. In both of these trials on friable alluvial river-bottom soils Mayaguez nos. 28 and 42 gave more satisfactory percentages of sugar in cane and produced more sugar per acre than did P.O.J. 2878. Cane growers in the San German Valley are fortunate in having cropped P.O.J. 2878 largely on clay to silty clay rather than on soils of this type; otherwise the rapid extension probably would result in heavy financial losses similar to those along the north coast. A variety trial, comparing Mayaguez 28 and B.H 10(12) on silt loam, is recommended for this district.

In the San German Valley district of Russell & Co., P.O.J. 2878 equaled B.H. 10(12) in cane production in gran-cultura plantings of the 1931 crop, although the latter variety was grown on the more fertile soils. In 1932, P.O.J. 2878 was markedly superior to B.H. 10(12) in both gran cultura and first ratoons, regardless of whether comparisons were made between plantings of varieties in the same field, or between the average results of the total areas for each variety.

[9] The soil was so designated by Francisco Murati.

P.O.J. 2878 yielded a ton more sugar per acre than did P.O.J. 2725 in the variety trial at Filial Amor, and also was superior to F.C. 916, P.R. 803, and P.O.J. 2714. The general field results for both 1931 and 1932 crops in the San German Valley indicated that P.O.J. 2878 will either equal or exceed P.O.J. 2725 in cane production and in sugar production and, on account of its erect growth habit, will develop less rot. The percentage of sugar in cane of P.O.J. 2878 was in general either equal or superior to that of P.O.J. 2725 or B.H. 10(12).

Mosaic and a droughty period of 3 to 4 months restrict the extension of B.H. 10(12) in the San German Valley, but they do not affect that of P.O.J. 2878. Yields of ratoons of susceptible varieties show marked reduction and cost of roguing is high; consequently, B.H. 10(12) is rapidly being replaced by the mosaic-resistant P.O.J. 2878.

PRIMAVERA AND FIRST-RATOON TRIALS AT CENTRAL AGUIRRE

The centrals along the south coast have been conservative about adopting P.O.J. 2878 or testing it extensively. B.H. 10(12) has given satisfactory results because of good cultural conditions and the fact that most of the land is under irrigation. Furthermore, unlike the situation along the north coast or in the western end of the island, mosaic has never been a serious problem and in fields of B.H. 10(12) has easily been controlled by systematic roguing. Except for general field plantings, data on only one variety trial with P.O.J. 2878 are available for the entire south coast.

P.O.J. 2878 has not invariably given a low sucrose content on friable rich alluvial soils. In the primavera variety trial carried on at Hacienda Josefa by Central Aguirre in cooperation with the Insular Experiment Station on soil of this type, a perfectly drained loam, with a very porous subsoil, P.O.J. 2878 gave a very satisfactory sucrose content. A 12–8–4 fertilizer, at the rate of 400 pounds per acre, was applied to the crop and was followed later with ammonium sulphate at the same rate. The results are shown in table 24.

TABLE 24.—*Results of sugarcane variety tests on irrigated perfectly drained loam at Central Aguirre, Colonia Melania, Hacienda Josefa, 1930* [1]*–31*

Variety and culture	Germination	Acre yield of cane	Acre yield of sugar	Sugar in cane	Rainfall	
					Total	Two months before harvest
13½-month primavera cut in March 1930, irrigated 143.76 inches:	*Percent*	*Tons*	*Tons*	*Percent*	*Inches*	*Inches*
P.O.J. 2878 [2] (averages of 9 plats)[3]	82	73.77±1.31	8.56±0.14	11.60		
B.H. 10(12) (averages of 7 plats)	87	65.57±1.31	7.91± .08	12.06	49.88	2.55
S.C. 12/4 (averages of 6 plats)	78	61.16±1.69	6.61± .28	10.80		
12½-month first ratoons cut in April 1931, irrigated 81.95 inches:						
P.O.J. 2878 [4] (averages of 9 plats)		43.38± .81	5.40± .60	12.44		
B.H. 10(12) (averages of 7 plats)		37.83± .91	4.93± .14	13.01	28.61	1.51
S.C. 12/4 (averages of 6 plats)		37.40±1.38	4.52± .07	12.08		

[1] RICHARDSON KUNTZ, P. LA PRODUCCIÓN DE NUEVAS VARIEDADES DE CAÑA Y SUS RESULTADOS EXPERIMENTALES. P.R. Dept. Agr. and Com. Insular Expt. Sta. Bul. 38:21. 1931.

[2] Considerable arrowing and uprooted stools were observed in the primavera growth of P.O.J. 2878.

[3] Plats ½₀ acre in size.

[4] No arrowing occurred in the ratoon plats of P.O.J. 2878.

The Javan variety was superior to S.C. 12/4 in sucrose content in both primavera and first ratoons. The percentage of sugar in cane of B.H. 10(12) was not markedly better than that of P.O.J. 2878 for either year. Conditions were, however, satisfactory for ripening, there being less than 3 inches of rain during the 2 months preceding the harvest of 1930, and still less during this critical period in 1931.

P.O.J. 2878, as an average for 9 replicated $\frac{1}{20}$-acre plats, was definitely superior in cane production to both S.C. 12/4 and B.H. 10(12). The margin of superiority in the primavera crop over the nearest competitor, B.H. 10(12), was 8.2 tons of cane per acre; in tons of sugar per acre the margin of superiority was 0.65. In the first ratoon the margin of superiority over B.H. 10(12) was 5.55 tons of cane per acre; in tons of sugar per acre the margin of superiority was 0.47. During both crops P.O.J. 2878 produced 1.22 tons more sugar per acre than did B.H. 10(12).

This variety trial indicated that higher sugar and cane production per acre might be secured from P.O.J. 2878 than from B.H. 10(12), both in primavera and first ratoons. However, it is not definitely known whether B.H. 10(12) or P.O.J. 2878 is the better variety at Central Aguirre. Ratoons of P.O.J. 2878 have not in general made a favorable growth. On account of this uncertainty the field superintendent of Central Aguirre is no longer extending plantings of P.O.J. 2878.

GENERAL FIELD PLANTINGS ALONG THE SOUTH COAST

At Central Aguirre P.O.J. 2878 was tested in 1931 on a very heavy, silty, poorly drained soil under irrigation. Two cuttings were placed in holes spaced 76 by 152 centimeters. Two bud cuttings of P.O.J. 2878 and three of B.H. 10(12) were used. The cane production on 7 acres was 50.5 tons per acre for P.O.J. 2878, which was decidedly inferior to a similar area of B.H. 10(12) in an adjoining field with an acre production of 63.6 tons. The crusher juice analyses on carload lots of 10 to 15 tons showed no significant differences in juice quality, as shown in table 25.

TABLE 25.—*Crusher juice analyses on carload lots of 10 to 15 tons of two varieties of sugarcane grown at Central Aguirre, 1931*

Variety	Date of analyses	Crusher juice analyses	
		Sucrose	Purity
		Percent	*Percent*
B.H. 10(12)	Feb. 2	17.11	87.0
	Feb. 3	16.12	86.3
	Feb. 4	15.48	85.5
Average		16.24	86.3
P.O.J. 2878	Feb. 6	15.26	83.9
	do	15.13	82.7
	do	16.11	84.5
	Feb. 7	17.33	87.1
	do	17.28	87.2
Average		16.22	85.1

The general field results of the 1932 crop of P.O.J. 2878 at Central Aguirre are given in table 26.

TABLE 26.—*Results of sugarcane variety tests by Luce & Co., Central Aguirre, 1932,*[1] *and monthly rainfall, July 1930–January 1932*

Variety, culture, size of field, and character of soil [2]	Acre yield of cane	Normal juice analyses		Sugar in cane	Available 96° sugar per acre
		Sucrose	Purity		
P.O.J. 2878 (16¼-month gran cultura cut in January):					
Field no. 2 (4 acres), Hacienda Florida Mercado, irrigated lowland; silty clay loam	*Tons* 99.00	*Percent* 13.92	*Percent* 82.7	*Percent* 10.45	*Tons* 10.34
B.H. 10(12) (17-month gran cultura cut in February):					
Fields nos. 29, 30, 31 (17 acres), Hacienda Florida Mercado, irrigated lowland; silty clay loam	75.9	15.74	86.5	12.10	9.19
P.O.J. 2878 (16¼-month gran cultura cut in December):					
Field no. 8 (9 acres), Hacienda Altura,[3] irrigated lowland; clay	93.3	12.00	76.5	8.45	7.89
B.H. 10(12) (15-month gran cultura cut in January):					
Field no. 22 (21 acres), Hacienda Altura, irrigated lowland; clay	69.5	15.38	84.5	11.54	8.02
P.O.J. 2878 (16¾-month gran cultura cut in January):					
Field no. 61 (11.73 acres), Hacienda Josefa, irrigated lowland; silt loam	82.5	15.86	84.9	11.89	9.83
B.H. 10(12) (16-month gran cultura cut in December):					
Field no. 62 (11.42 acres), Hacienda Josefa, irrigated lowland; silt loam	81.8	15.02	84.9	11.31	9.26
P.O.J. 2878 (16½-month gran cultura cut in December):					
Field no. 115 (6.8 acres), Hacienda Algarrobos, irrigated lowland; loam	84.7	13.85	82.2	9.67	8.13
P.O.J. 2878 (17-month gran cultura cut in January):					
Field no. 70 (10 acres), Hacienda Algarrobos, irrigated lowland; clay loam	71.2	14.29	81.7	10.29	7.32
B.H. 10(12) (17½-month gran cultura cut in January):					
Field no. 116 (14.87 acres), Hacienda Algarrobos, irrigated lowland; loam	62.0	13.86	85.6	10.23	6.19
B.H. 10(12) (15-month gran cultura cut in January):					
Field no. 27 (8.29 acres), Hacienda Algarrobos, irrigated lowland; clay loam	57.6	15.13	86.2	11.23	6.47

Monthly rainfall at four sugarcane test fields				
	Josefa field J-61	Florida Mercado field 2	Altura field 8	Algarrobos field 115
1930	*Inches*	*Inches*	*Inches*	*Inches*
July	0.32	0.42	-------	3.64
August	2.65	1.41	2.43	3.53
September	2.25	1.30	1.84	4.55
October	5.42	1.99	1.63	3.96
November	4.04	2.76	1.80	4.40
December	.53	1.36	1.35	.31
1931				
January	.41	.28	1.40	.37
February	2.54	1.27	1.60	2.20
March	.85	.13	-------	.75
April	1.56	.93	.50	1.12
May	13.61	6.83	7.63	14.00
June	13.32	13.04	16.01	12.44
July	4.88	3.53	3.12	6.80
August	5.79	3.62	4.90	5.89
September	8.97	5.51	8.21	7.97
October	7.01	1.88	.90	8.35
November	8.05	6.40	4.78	6.57
December	2.75	.62	.80	4.10
1932				
January	.62	-------	-------	-------
Total	85.57	53.28	58.90	90.95

[1] These data were supplied by M. J. Oben, Central Aguirre.

[2] Soils so identified by the field superintendent.

[3] Fields nos. 8 and 22 of Hacienda Altura received only 1 fertilizer application.

Five gran-cultura fields, 4 to 11 acres, of P.O.J. 2878 were compared with adjoining fields of B.H. 10(12). All fields were lowlands under irrigation. A 12–8–4 fertilizer was applied at the rate of 400 pounds per acre at 6 weeks after planting, and ammonium sulphate at the rate of 400 pounds per acre 6 weeks later; at 5 months ammonium sulphate was again applied at the rate of 400 pounds per acre. Fields 8 and 22 received only the first application. In general, the sucrose content was lower for P.O.J. 2878. In field 8 of Hacienda Altura, P.O.J. 2878 gave a sugar in cane of only 8.45 percent. In the other 4 fields, P.O.J. 2878 either compared well with B.H. 10(12) in sucrose content or more than compensated for lower sucrose content by a higher cane production. The superiority in cane production was especially marked at Hacienda Florida, Mercado, where P.O.J. 2878 produced 99 tons of cane per acre and 10.34 tons of sugar per acre as opposed to 75.9 tons of cane and 9.19 tons of sugar for B.H. 10(12). The average cane production on 5 fields of P.O.J. 2878 in gran cultura was 86.14 tons per acre, or nearly 17 tons more than from adjoining fields of B.H. 10(12). The average sugar production for P.O.J. 2878 was 8.7 tons per acre, or nearly 1 ton more than for B.H. 10(12).

At Central Mercedita, Ponce, in the 1932 grinding season, a gran-cultura field trial of P.O.J. 2878 was made in comparison with B.H. 10(12) on heavy clay soil under irrigation. The 20.5 acres of P.O.J. 2878 averaged 81.85 tons of cane per acre and 9.339 tons of sugar per acre as opposed to 75.06 tons of cane and 8.26 tons of sugar for B.H. 10(12). P.O.J. 2878 ripened earlier than did B.H. 10(12). The sugar yield for P.O.J. 2878 was 11.4 percent, whereas that for B.H. 10(12) was only 11 percent. This preliminary result is encouraging. Central Mercedita has certain fields with an alkaline soil where B.H. 10(12) is practically a failure, and P.O.J. 2878 makes a good growth. A variety trial should be conducted here for a more accurate comparison of P.O.J. 2878 and B.H. 10(12).

On 9.58 acres of irrigated primavera at Central Fortuna, P.O.J. 2878 averaged 40.6 tons of cane per acre, nearly 9 tons more than did 5.2 acres of B.H. 10(12) in the same field which averaged 31.79 tons. Although time of harvest was normal, March 28, and the canes were 14 months old, P.O.J. 2878 gave a low purity, 78.9 percent, as opposed to a purity of 82.8 percent for B.H. 10(12). The harvesting and transportation to Central Guanica from the field of P.O.J. 2878 of 8.89 extra tons of cane per acre should be considered; the extra cost of these operations was $12.80 per acre, almost enough to offset the difference in sugar production. The soil was a friable type in which P.O.J. 2878 has seldom given a high sucrose content.

UPROOTING AS A STORM RISK WITH P.O.J. 2878

Because it is not anchored very securely by its root system in the first crop and also because of its very erect growth habit, P.O.J. 2878 was thought to be less able to withstand the force of the wind than were other varieties. In 1930 a few uprooted stools of P.O.J. 2878 were observed in the propagation plats at Mayaguez and at Hormigueros. Several centrals began to limit its extension because of the

storm risk apparently involved. Data were collected to determine the seriousness of this risk and the possibility of reducing it.

In a 10-acre field at Central Pagan, Anasco, P.O.J. 2878 was spaced 90 by 135 centimeters (3 by 4½ feet) October 10, 1929, on top of banks in a friable, silty alluvial soil that is subject to overflow. Considerable uprooting was observed in the fall, and the cane lodged badly under a moderately strong wind and was therefore cut for seed in January. Counts taken after harvest to determine the percentage of uprooting showed that of 570 stools along the edges of the ditches 66, or 11.6 percent, had uprooted, whereas of 500 stools in the middle rows where they afforded more support for one another only 33, or 6.6 percent, had uprooted. This indicated that a more closely spaced planting would have reduced damages.

At Central Pagan, in 1930, 20 to 25 percent of the stools in a 10-acre field of late-planted gran cultura were blown down. At maturity recovery was practically complete and no dead stools were observed. The planting of P.O.J. 2878 in September or in October will be helpful in overcoming its tendency to uproot; late gran-cultura planting results in a young growth of cane in the following late spring and summer when wind injury is common; the young stools that are blown down do not uproot and thus they occasion very little loss.

The worst case of uprooting in the San German Valley district of Russell & Co. was in a 22-acre field at Hacienda Luisa. Spacing was abnormally wide, 90 by 135 centimeters, affording the stools little support for one another. Single-bud cuttings were planted on the banks. Such plantings are necessarily very shallow, and there is much less support against uprooting than where 3-bud cuttings with their larger root development and deeper planting are used. The percentage of uprooting was determined by examining stools in twelve 8-row banks shortly after the harvest, and the clearing of the trash. The data were collected in alternate banks so that they might be representative of a large area. Of 2,400 stools 381, or 15.9 percent, had more or less uprooted, but of this number only 2 had died and 112 exposed as much as half of their roots. Thus, much less than 15.9 percent of the stools were seriously affected by uprooting. Uprooting was somewhat greater along the edges of the ditches than in the middle of the banks.

The proportion of rotten canes was determined for 200 uprooted and 200 normal stools, as shown in table 27.

TABLE 27.—*Effect of uprooting on percentage of rotten canes*

Locality	Kind of stools	Stools examined	Total canes	Rotten canes	
		Number	*Number*	*Number*	*Percent*
East and north part of field	Normal	100	1,149	128	11.2
Do	Uprooted	100	1,126	155	13.7
West part of field	Normal	100	1,017	156	15.3
Do	Uprooted	100	1,103	149	13.5

All trash remaining after the field was burned over was removed by hand from the stools. The freshly cut cane-stalk stumps were then counted. Some cane surfaces of both normal and uprooted stools were missed on account of their having been cut below the ground

surface. Very little difference between normal and uprooted stools, either in the total number of canes or in the proportion of rotten canes, was found.

Examination of 303 stools on a 4-acre field at Filial Amor, where spacing and planting were the same as in the Luisa field, showed that 39, or 12.8 percent, had half uprooted, and that 27, or 8.9 percent, exposed one fourth or less of their roots. Fifty uprooted stools had a total of 541 canes, of which 14.6 percent were rotten, and 50 normal stools had a total of 511 canes, of which 15.4 percent were rotten, an insignificant difference. Apparently, a large proportion of the canes of uprooted stools recover and mature. The development of many water suckers from the overturned stools of P.O.J. 2878 causes a lowered purity and sucrose, and for this reason is much more serious than is loss from rotten canes resulting from a windstorm.

Aristides Gonzalez, of Central Carmen, reports that P.O.J. 2878 suffered very little from uprooting during the violent windstorm of September 10, 1931. The storm area extended 5 to 6 miles inland and included most of the cane lands of the north coast. The wind, as recorded by the United States Weather Bureau in San Juan, blew for 1 hour at the rate of 60 miles an hour.

Manuel del Valle, of Central Constancia, where 400 acres of P.O.J. 2878 were under cultivation, reported as follows on the effect of this storm on P.O.J. 2878:

> During the hurricane of September 1931 a violent wind began blowing from the north, at first causing much damage to the canes of B.H. 10(12) and S.C. 12/4, many of them being thrown over and broken. Contrary to expectations, the canes of P.O.J. 2878 withstood the wind, merely waving back and forth. As the storm progressed, the wind veered around to the opposite direction, blowing over more of the B.H. 10(12) and S.C. 12/4 canes, causing them to become entangled and preventing recovery. The canes of P.O.J. 2878 also withstood the effect of the wind from the reverse direction and only a negligible amount of cane was blown down and uprooted.

Alberto Roig, of Humacao, reports that the canes of P.O.J. 2878 first ratoons were laid flat by the violent hurricane of September 1932 and escaped with little damage whereas the canes of B.H. 10(12) remained partly erect and most of the tops were either broken off or defoliated.

Apparently closer spacing of the 1932 crop reduced the storm risk with P.O.J. 2878. Much of the uprooting of P.O.J. 2878 in 1931 was due to wide spacing to accelerate its extension.

Observations, made in 1931 on 50 acres of P.O.J. 2878 in gran cultura in the Isabela district of Central Coloso, showed no cases of uprooting, regardless of the kind of spacing used. The wind in this district is continuous and mainly from one direction and causes the canes to lean over gradually as they grow. By the time they are 8 to 10 feet long they are in a reclining position and are rarely uprooted by strong winds.

Data on 9 fields of the 1931 crop are given in table 28.

TABLE 28.—*Data on uprooting in nine fields of P.O.J. 2878 sugarcane, 1931*

Locality where grown, culture, size of field, and character of soil [1]	Stools observed	Stools uprooted	Proportion uprooted ¼ to ½ way	Spacing per single cutting	How planted
	Number	*Number*	*Percent*	*Centimeters*	
Central Coloso, Corsica district, gran cultura (5 acres), loose sandy alluvial soil.	1,278	149	11.7	135 by 150	In holes 22 centimeters deep.
Central Pagan, gran cultura, Anasco (10 acres), loose sandy alluvial soil.	1,070	99	9.2	90 by 135	On top of bank.
San German Valley district of Russell & Co., Hormigueros, gran cultura (22 acres), clay loam, fairly compact.	2,400	381	15.9	90 by 135	Do.
San German Valley district of Russell & Co., Filial Amor, gran cultura (4 acres), clay loam, fairly compact.	303	39	12.8	90 by 135	Do.
Central Eureka, Hormigueros, gran cultura (0.3 acre), alluvial clay loam of fairly compact type.	1,463	24	1.64	[2]	Do.
Central Fortuna, Fortuna, gran cultura (5 acres), loose alluvial clay loam.	2,232	5	.22	30 by 135	In deep furrows.
Central Aguirre, Guayama, gran cultura (7 acres), heavy clay.	1,840	0	0.00	75 by 150	In holes.
Farm of Alcides Zeno, Yauco, gran cultura (10 acres), loose, alluvial soil.	1,000	0	0.00	30 by 135	In deep furrows.
Central Aguirre, Guayama, primavera (0.2 acre), loose alluvial soil.	1,000	110	11.0	30 by 150	Do.

[1] All soils so designated by the superintendents of the respective fields.
[2] Planted as long cane.

Where planting was on top of the banks and open spacing was practiced, the proportion of uprooted stools ranged roughly from 9 to 16 percent; and usually where close spacing and deep planting were used practically no uprooting occurred. These observations are in harmony with the results of the spacing trial with P.O.J. 2878 conducted by the Insular Department of Agriculture at Central Mercedita, Ponce; in plats with the closest spacing, 105 centimeters between rows, there was least uprooting.[10] In the 1932 crop, when most of the P.O.J. 2878 area was planted either as long cane or spaced 30 by 135 centimeters per cutting, no storm damage was reported even from those areas where cane is planted on top of the banks.

THE ADVANTAGES OF RATOONING P.O.J. 2878

Assuming an equal sugar production for P.O.J. 2878 and for B.H. 10(12) in the plant-cane crop, P.O.J. 2878 has several advantages in succeeding crops giving it the preference over B.H. 10(12). These are mosaic resistance, ability when young to recover after a flood, prolific stooling habit, superior ratooning power, and reduced cultivation costs. As a result of the mosaic resistance, the cost of roguing is eliminated. This is an important factor near Coloso where conditions favor the spread of the disease and the roguing of B.H. 10(12) increases replanting costs.

On the lowlands of Coloso that are subject to overflow, 4-month-old B.H. 10(12) plantings did not recover after either the 1928 or the 1932 hurricane, whereas adjoining fields of P.O.J. 2878 and P.O.J. 2725 of the same age recovered completely. All varieties were under water for nearly a week on each occasion. Fifty acres of B.H. 10(12) at Coloso were destroyed by overflow resulting from the 1928 hurricane.

Data on replanting costs were collected on 314 acres of P.O.J. 2878 first ratoons and on a similar area of B.H. 10(12) of the 1932 crop at

[10] RICHARDSON KUNTZ, P. LA PRODUCCIÓN DE NUEVAS VARIEDADES DE CAÑA Y SUS RESULTADOS EXPERIMENTALES. P.R. Dept. Agr. and Com., Insular Sta., Bul. 38: 54. 1931.

Coloso. Practically no replanting was required for P.O.J. 2878, whereas the costs of replanting fields of B.H. 10(12) ranged from $3 to $4 per acre. Owing in part to more prolific stooling habit, fewer stools of P.O.J. 2878 were destroyed during harvesting and hauling operations.

Owing to a combination of its mosaic resistance, prolific stooling habit, and ability to withstand drought and overflow, P.O.J. 2878 is an excellent ratooner and may be grown for several stubble crops. This is generally not true for B.H. 10(12), which dies out during the second ratoon at Coloso, and cannot, owing to excessive replanting costs, be grown profitably for more than two crops. Even near

FIGURE 7.—P.O.J. 2878 is very prolific and makes rapid growth in first ratoons at Julia Farm, Central Eureka. This has resulted in low cultivation costs. Four months old when photographed, December 10, 1930.

Central Aguirre, a district to which B.H. 10(12) is very well adapted, not more than one stubble crop is grown. Hence, in addition to increased cultivation and replanting costs, the cost of roguing, and the flood risk, the work of frequent land preparation must be charged against the cropping of B.H. 10(12). These drawbacks of B.H. 10(12) tend to offset the profuse arrowing habit and somewhat lower percentages of sugar in cane of P.O.J. 2878.

CULTIVATION COSTS

Cultivation costs and successful ratooning are influenced by position of the leaves, whether erect or spreading; rapidity of growth during the first 4 or 5 months, and prolificacy or number of canes per stool. In leaf position during the first few months, P.O.J. 2878 has an advantage over B.H. 10(12). The prolific stooling and early spreading growth habit which make possible low cultivation costs with P.O.J. 2878 are illustrated in figure 7. The two stools in front had

24 and 25 canes, respectively. The average count for 50 stools taken at random was 20 canes. The spacing was 135 centimeters between rows with two 3-bud cuttings planted every 90 centimeters in the row. B.H. 10(12) gave only about half as many canes under similar conditions and took a month longer to close in.

Russell & Co. reports a saving in cultivation costs of $3.50 per acre on over 100 acres of first ratoons of P.O.J. 2878 compared with a like area of B.H. 10(12). Central Coloso reports nearly double this saving on 314 acres of P.O.J. 2878 first ratoons. At Centrals Coloso and Eureka P.O.J. 2878 ratoons required only 2 or 3 hand weedings and B.H. 10(12) 5 or 6.

Observations which confirm the above reports are given in table 29 on 5 fields of P.O.J. 2878 ratoons. Owing to a somewhat more rapid early growth and a superiority of about 150 more canes per 31 meters of row P.O.J. 2878 closed in nearly 1 month earlier than B.H. 10(12). P.O.J. 2878 also closed in somewhat earlier than P.O.J. 2725. The early growth superiority of P.O.J. 2878 to P.O.J. 2725 is shown in figure 1. The canes are 5-month-old gran-cultura plantings grown at Hormigueros on the property of Russell & Co.

TABLE 29.—*Data on closing in of sugarcane varieties in April 1932*

Variety, culture, treatment, and locality	Canes per 31 meters (average of two counts)	Average height to leaf tip of 50 primary shoots	Distance clear to vision	Closed in
	Number	*Meters*	*Feet*	
P.O.J. 2878 [1] (3½-month first ratoons), no treatment recorded, Filial Amor.	570	----------	20	Almost.
B.H. 10(12) (3½-month first ratoons), no treatment recorded, Filial Amor.	405	----------	40	No.
P.O.J. 2878 (3½-month first ratoons), no treatment recorded, Filial Amor.	619	1.77	15	Almost.
B.H. 10(12) (3½-month first ratoons), no treatment recorded, Filial Amor.	431	1.74	30	No.
P.O.J. 2878 (4-month first ratoons), no treatment recorded, Central Pagan, Anasco.	382	1.74	25	Almost.
B.H. 10(12) (4-month first ratoons), no treatment recorded, Central Pagan, Anasco.	290	1.66	45	No.
P.O.J. 2878 (2½-month first ratoons), trash lined and banks not even broken; 2 weedings, Julia farm, Central Eureka.[2]	554	----------	--------	Beginning.
P.O.J. 2725 (2½-month first ratoons), trash lined and banks not even broken; 2 weedings, Julia farm, Central Eureka.	440	----------	--------	Do.
P.O.J. 2878 (3-month first ratoons), trash lined and banks broken; only 1 weeding, Filial Amor.	660	----------	--------	Yes.
P.O.J. 2725 (3-month first ratoons), trash lined and banks broken; 1 weeding.	479	----------	--------	Almost.

[1] Data were collected from plats of B.H. 10(12) or from P.O.J. 2725 which adjoined those of P.O.J. 2878, and the comparable data are given below those of P.O.J. 2878 from the same respective field.
[2] Central Eureka gives 5 or 6 weedings to B.H. 10(12) and only 2 or 3 to P.O.J. 2878.

REDUCTION IN CANE GIRTH OF P.O.J. 2878 IN STUBBLE CROPS

Considerable objection has been made to P.O.J. 2878 because it is thought to show pronounced decrease in cane girth in ratoons. To substantiate this claim, cane diameters in 10 fields in which both P.O.J. 2878 and B.H. 10(12) of the same age and treatment were growing—5 fields of fall-planted cane and 5 fields of first ratoons, respectively, were measured. All canes, water suckers excepted, of a given number of stools were measured. The average cane girth of 250 canes of B.H. 10(12) was 3.28 centimeters in the fall-planted crop

as opposed to 3.07 centimeters for the same number in first ratoons, which was a reduction in girth of 6 percent. The average for 250 canes of fall-planted P.O.J. 2878 was 3.05 centimeters, as opposed to 2.78 centimeters for first ratoons, which was a reduction in girth of 8.8 percent. Greater differences in reduction in girth might develop from repeated ratooning. Although there was little difference between the two varieties the reduction in girth is more noticeable with P.O.J. 2878 than with B.H. 10(12), as the Javan variety is not large girthed even in the first crop, and the same relative loss brings it much nearer than B.H. 10(12) to a thin type of cane.

ADVANTAGES AND DISADVANTAGES OF P.O.J. 2878 DURING HARVEST

Factors influencing harvesting costs include ease of trashing or number of clinging leaves and sprouted roots; position of cane, whether erect or reclining; cane girth; tonnage per acre of a given variety; and hairiness of leaf sheaths. P.O.J. 2878 trashes very freely and develops very few sprouted roots. Its canes generally remain erect and rarely become tangled as do those of B.H. 10(12). The straightness of the canes of P.O.J. 2878 facilitates loading them into carts, and a heavier load of these canes can be packed into a given volume than is possible with the crooked canes of B.H. 10(12). In many areas in Puerto Rico it either equals or exceeds B.H. 10(12) in cane tonnage. In determining the price per ton for the cane cutter, the only handicaps of P.O.J. 2878 are the smaller cane girth and hairy leaf sheaths.

Fifty canes of each variety of gran-cultura plantings under irrigation when measured at Central Mercedita, Ponce, showed that B.H. 10(12) averaged in girth 3.47 centimeters, P.O.J. 2878, 3.03 centimeters, and Mayaguez 28, 3.4 centimeters. The average cane diameter of B.H. 10(12) was one seventh greater than that of P.O.J. 2878. The erectness of the P.O.J. 2878 canes, however, is thought to more than offset inferior cane girth. The erect growth and prolific stooling habit of P.O.J. 2878 is illustrated in figure 4.

For comparison of ease of trashing, 50 canes of each variety in gran cultura were observed at Isabela. P.O.J. 2878 averaged 7 clinging leaves per cane, or 1 leaf less than the average for B.H. 10(12). S.C. 12/4 averaged 11 clinging leaves per cane, whereas P.O.J. 2725 had as high as 18.

REDUCED HARVESTING COSTS

Harvesting costs at Coloso for P.O.J. 2878 are estimated at 10 to 15 cents less per ton of cane than for the other standard varieties now grown. In the Rincon district of Central Coloso, P.O.J. 2878 is harvested at 40 percent less than B.H. 10(12). The harvester makes fewer motions per given cane weight as less time is consumed in harvesting the erect straight canes of P.O.J. 2878 than the reclining tangled canes of B.H. 10(12). At Central Eureka harvesting costs for P.O.J. 2878 are estimated to be 20 percent less per ton than for B.H. 10(12) or for S.C. 12/4. At Central Aguirre P.O.J. 2878 does not remain erect and becomes badly tangled owing to the high tonnage induced by adequate irrigation, and somewhat more is paid for harvesting it than for B.H. 10(12). Apparently the cane cutters near Aguirre emphasize their aversion to hairs on the leaf sheaths. P.O.J. 2878 is certainly far easier to harvest than P.O.J. 2725, and, except on the Central Aguirre properties, is preferred by cane cutters to B.H. 10(12).

RETARDED DEFECATION WITH P.O.J. 2878

Retarded defecation during the grinding of P.O.J. 2878 has been reported from Centrals Coloso and Constancia. The cane of other varieties has had to be ground along with that of P.O.J. 2878 when the purity of the latter was very low. No trouble was experienced at either central when the purity of P.O.J. 2878 was satisfactory. Central Guanica ground about 600 acres of P.O.J. 2878 in 1932, but had no serious difficulty with defecation. This cane was grown largely on well-ditched clay where the variety ripens well and high purity is the rule. Normal defecation may be had on proper soils. P.O.J. 2878 should never be grown on humid lowlands where it does not ripen well.

SUMMARY AND CONCLUSIONS

At Fajardo and the eastern end of the island gran-cultura P.O.J. 2878 did not equal B.H. 10(12) in sugar production, either in preliminary or in general field trials on lowland. The value of P.O.J. 2878 on upland soils in this area is not known.

P.O.J. 2878 outyielded B.H. 10(12) in sugar production in primavera and ratoons near Cambalache and San Vicente. These results were not, however, corroborated by general field gran-cultura plantings on lowland.

General field results along the entire north coast and in the Anasco Valley demonstrated the superiority of B.H. 10(12) over P.O.J. 2878 in gran-cultura plantings on lowland soils subject to overflow; this was particularly true of the friable alluvial soils. In the same area the sugar production of P.O.J. 2878 in gran cultura has been superior to S.C. 12/4 and to P.O.J. 2725 on uplands.

In the gran-cultura variety trial at Central Coloso on silty clay, P.O.J. 2878 equaled B.H. 10(12) in sugar production. This result was confirmed by general field tests largely on soils of a heavy type, either clay or silty clay.

At Isabela, in general field trials, P.O.J. 2878 was superior to S.C. 12/4 in cane production, but generally lower in sugar yield. Neither S.C. 12/4 nor P.O.J. 2878 is satisfactory for this district but both give better results than does B.H. 10(12).

At Anasco P.O.J. 2878 was definitely inferior to B.H. 10(12) in the 1931 variety trial on friable alluvial soil subject to overflow. In two other gran-cultura variety trials at Anasco, near Central Pagan, on soil of a heavier type the difference between B.H. 10(12) and P.O.J. 2878 was insignificant in one instance, but P.O.J. 2878 was superior in sugar production in the other.

General field results in the San German Valley were favorable and corroborate those with P.O.J. 2878 in variety trials. Both primavera and gran cultura outyielded adjoining fields of B.H. 10(12) or P.O.J. 2725. P.O.J. 2878 is considered the outstanding variety for the clay soils in this area where it has uniformly given a high sucrose content. On friable alluvial soils which were flooded over its juices were inferior.

Because of an inadequate number of variety trials along the south coast, it is not certain whether P.O.J. 2878 or B.H. 10(12) is the better variety for that area.

The objections to P.O.J. 2878 are tendency to uproot, reduction in cane girth in ratoons, hairy leaf sheaths, profuse arrowing, and retarded defecation due to low percentage purity.

The storm risk due to uprooting with P.O.J. 2878 is, in general, no greater than with other varieties. The low sucrose in P.O.J. 2878, resulting from the development of numerous water suckers on gran cultura that has been blown over, is more serious than is the rotting and dying of cane resulting from uprooting. The storm risk is reduced by close spacing and by planting deep in furrows, or by growing P.O.J. 2878 as a primavera or as a late gran-cultura crop.

P.O.J. 2878 canes become thinner in ratoons, but the proportion of reduction is not much greater than for B.H. 10(12) canes. A radical reduction in cultivation costs of first ratoons may be secured through the use of P.O.J. 2878. This more than offsets the disadvantage of thinner canes. Where mosaic and drought resistance and ability to ratoon repeatedly are important, as at Centrals Coloso, Pagan, and Eureka, and in the San German Valley, P.O.J. 2878 is one of the best varieties and is rapidly replacing both P.O.J. 2725 and B.H. 10(12).

The tendency, in the districts of Aguirre, Pagan, and Isabela, of P.O.J. 2878 to arrow profusely, even in primavera plantings, is more than offset by its rapid growth, prolific stooling habit, and high cane production. Unlike P.O.J. 2725, P.O.J. 2878 arrows about November 15, and growth is not interrupted early enough to cause a serious reduction in primavera or first ratoons.

Retarded defecation will not give serious trouble unless P.O.J. 2878 is planted extensively on the poorly drained lowlands and on friable alluvial soils to which it is not adapted.

Advantages of P.O.J. 2878 are prolific stooling habit; rapid growth; high cane production; drought resistance; resistance to mosaic; ease of harvest, due to erect growth, and the free shedding of the leaves; ability to recover after being flooded; and ratooning power.

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